American Fruit Grower

JUNE · 1954

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DOW

PRIME FRUIT
is the pay-off for better mite control with
OVOTRAN WETTABLE

Dow miticide is effective against a wide variety of mite species in all life stages

Apple growers can control mites with Ovotran® Wettable. This superior miticide kills mite eggs—and, because of its long-term residual properties, it remains effective against mites in all life stages from egg to adult.

For a preventive program, apply Ovotran Wettable to apples in the pink stage—again in the petal-fall stage if mites are still present. Then follow in the first, third and fifth cover sprays. Build-up of mites is suppressed. This preventive program is usually more effective and less expensive than a corrective control program. Follow recommendations of local agricultural authorities.

Ovotran Wettable has low toxicity to beneficial insects such as pollenizers and mite predators. It is compatible with insecticides and fungicides commonly used in orchards. Ask your dealer for the Dow Fruit Spray Guide giving more complete suggestions for the use of Ovotran and other Dow orchard chemicals in regions east of the Rocky Mountains. THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Department, Midland, Michigan.

you can depend on DOW AGRICULTURAL CHEMICALS DOW

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JUNE 1954
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The photograph of Rome Beauty apples shown on our cover was taken at the Alary Ranch, Sandoval, N. Mex. The ranch is located on the Rio Grande River near Albuquerque. Photo by Harry Vroman.

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1. No run-off of spray material
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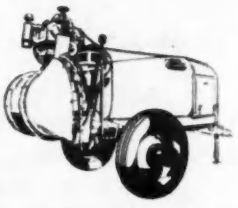

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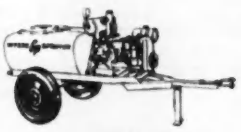

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General Purpose Sprayer

Spray mixtures applied to the Dodd orchard with a Myers Concentrate Sprayer require just one-fourth the water needed for dilute mixtures. With water content at a minimum, valuable spray material won't run off. Because concentrate spraying requires fewer stops for water, Mr. Dodd can cover 40 acres in a day by himself, yet be sure of effective spray protection.

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Concentrate spraying pays off again at the grading table. The Dodd orchard yields a high percentage of fancy fruit and a low percentage of culls. Let your nearby Myers sprayer dealer demonstrate the Concentrate Orchard Sprayer.

Write today for the name of your nearest Myers dealer.

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THE F. E. MYERS & BRO. CO.
1206 Orange Street
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This is something for you to think about

The next time you're buying an apple fungicide get CRAG glyodin solution—Here's what it gives you:

1	OUTSTANDING SCAB CONTROL	You can count on CRAG glyodin solution to protect both foliage and fruit.
2	BETTER QUALITY FRUIT	CRAG glyodin gives fruit with high color and finish that brings top market prices.
3	HIGHER YIELDS	CRAG glyodin helps give you-healthier trees that produce greater yields.
4	LOWEST COST	An easy-to-use liquid formulation that produces bigger and better crops at lowest cost per bushel.

If you want these advantages in an apple scab control fungicide, plus the bonus benefit of red mite suppression, use CRAG glyodin solution.

OTHER GROWERS HAVE SWITCHED TO CRAG GLYODIN SOLUTION ★ WHEN YOU USE IT YOU'LL LIKE IT. *Buy it and See!*

CRAG Trade-Mark **Fruit Fungicide 341**

A Glyodin Solution

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Chazy Orchards, Chazy, N. Y.

"We often used to get stuck while spraying with our wheel-type tractors. Spraying had to be a fair weather job. Now, with the Cat track-type Tractors on the job, we can spray in any kind of weather. What's more, they're inexpensive to operate and dependable under all conditions. We're very pleased with the way our Caterpillar Diesel Tractors perform!"*

If you're growing high-quality fruit you've got to lay the spray on when the time is right, even if your orchard is muddy. You can't afford to squander your time, fuel and money with wheel tractors that won't do the job satisfactorily. You can cross these worries off your list when you own a Cat Diesel Tractor. For example, the D2 Orchard Tractor pulls 7950 lbs. dead weight, where average 3-plow wheel tractors pull about 4000 pounds. This means you'll pull bigger loads . . . accomplish more . . . make fewer trips through the orchard. The D2 burns about 2 gallons of No. 2 furnace oil at full load . . . so you'll cut your fuel bill by 60% to 80% in comparison to gasoline power. Your Caterpillar Dealer will gladly bring the Cat Orchard Tractor you need to your place for you to compare with your present power. Name the date . . . he'll demonstrate!

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WRITE FOR ORCHARD BOOKLET

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Peoria, Ill.
Dept. AMF-64

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- ☐ I'd like a demonstration . . . no obligation on my part.
- ☐ I'm a student.

I have_____acres of orchard; my main crop is_____

Name_____

City_____ State_____

RFD_____

LETTERS TO THE EDITOR

What's in a Name

Dear Editor:

In reply to your recent inquiry regarding this ranch and its name, we wish to say that we were pleased to receive it.

This is a fruit ranch—we now have 60 acres of young orchard just coming into production. We purchased it in 1945, at which time there were only old trees here. We pulled these out and replanted all available space.

We have tried to find out more about the history of the place, as it apparently has carried this name for a long time—at least it is well-known in all of the surrounding towns. It was homesteaded by Colonel William Hunter, one-time editor of the *Chicago Blade*. He wrote a small book based on the north country called *Tales of the Frozen Dog*, which referred to a town of that name. We assume the ranch was later named after this book.

We are enclosing a small picture taken six years ago. Part of the orchard had just been planted then. The ranch buildings are located in the large clump of trees at the right. We are

at the head of a valley, surrounded on three sides by low hills. In this valley much fruit is produced, the majority of which are Italian Prunes and Bing, Lambert, and Royal Anne cherries, although we also produce apples, peaches, and pears.

Frozen Dog Ranch
Emmett, Idaho — Dorothy W. Smith

When the Frozen Dog Ranch subscribed to AMERICAN FRUIT GROWER, *we couldn't resist asking about the name. We've heard of some unusual names for orchards and fruit ranches, but Frozen Dog tops the list. The above is what we found.—Ed.*

A Word for the Small Grower

Dear Editor:

Enclosed you will find a money order for a three-year subscription to AMERICAN FRUIT GROWER. I would very much like to see more letters from amateur fruit growers to find out how they feel about growing fruit. It seems to me that most people today depend on the large commercial fruit grower for their fruit. Maybe the day will come when we small growers will have to chop down our home orchards and buy fruit from the supermarkets. I, myself, would rather have an old-variety apple right from the tree than any of the double-red or double-yellow apples from the store.

Dumont, N. J. — Herman Rambeau

Spraying to Prevent Runners

Dear Editor:

I am a berry grower out on the West Coast. In the April edition of AMERICAN FRUIT GROWER I read that quite a bit of work has been done to control runners on strawberries to produce a larger crop.

The article by R. F. Carlson of Michigan State College was very educational and interesting. However, I believe for successful application out here in California we have to consider a few points that may vary because of weather, etc. I would like to obtain a little more detailed information on this subject.

Torrance, Calif. — Lou H. Miyamoto

We have asked author Carlson of the Michigan Agricultural Experiment Station to send more detailed information direct to strawberry grower Miyamoto.—Ed.

Quality Produce in the Market

Dear Editor:

As the summer market season is close at hand, it is becoming apparent that the consumer determines the movement of produce. He seeks variety, quality, and low price, and shuns inferior products. Speed and convenience are of great importance, too, during periods of high economic level. This means rush and speed in transportation, quick sales, small packages, and easy and quick preparation of produce for the housewife.

There is great opportunity for the grower with imagination and skill who can take advantage of nearby markets and supply the quality and variety of produce that the consumer demands. The grade and quality of a crop that moves into market will depend upon the prices which the consumer is willing to pay.

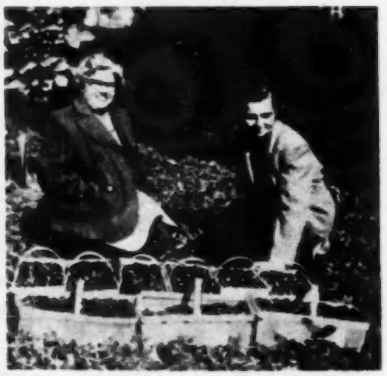
The call is for higher quality products. The fresh fruit and vegetable displays in retail stores have become the measure of the quality of the store, and the small package has become the feature of the market with more and more products finding their way into attractive sanitary packages. The household refrigerator and the freezing compartment in the home have greatly accelerated the sale of both fresh and frozen products.

Hammonton, N. J. — James Shoemaker

Results of Chestnut Harvest

Dear Editor:

Here is a photograph which I took of our last fall's chestnut crop. These chestnuts were



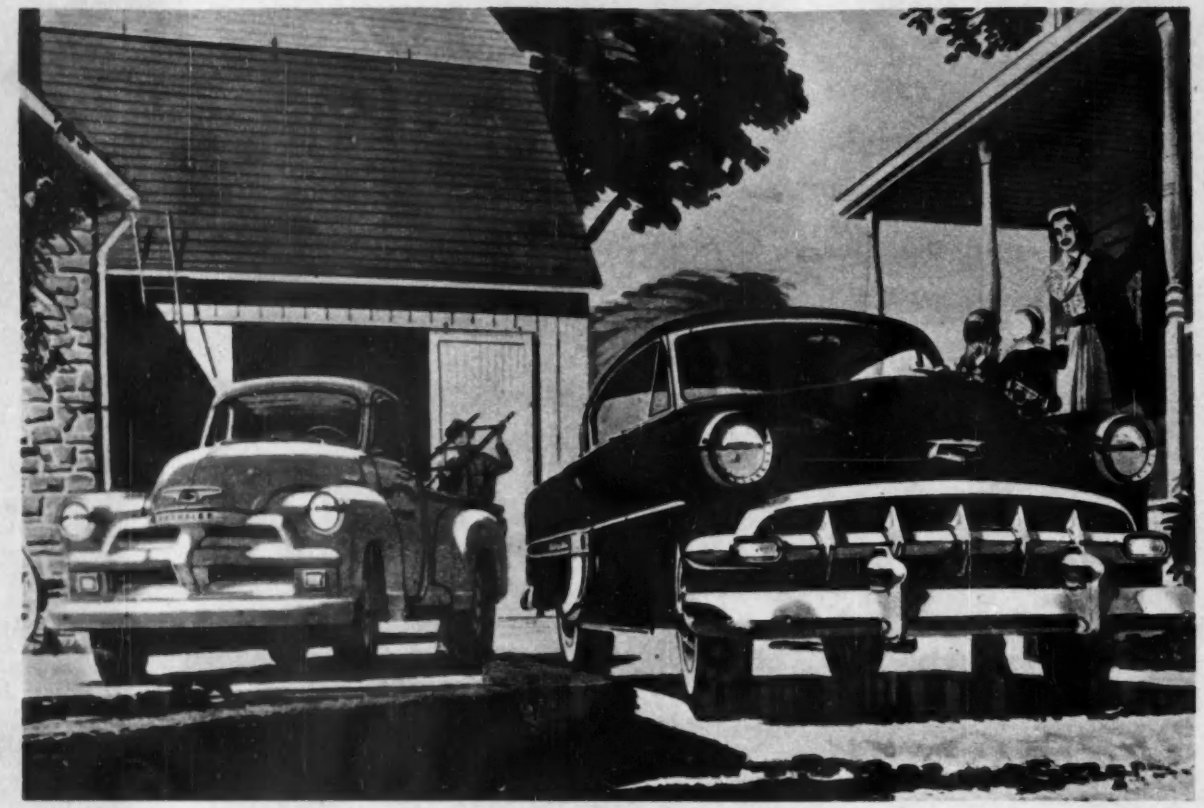
very sweet, and they retailed at $1.25 a pound.

Mansfield, Ohio — Christ Patakv, Jr.

"INCREASED YIELD! Why if we didn't have sprinkler-irrigation, we wouldn't have any yield at all!" That's what George Orthman, a progressive market grower of Darlington Road, Ramsey, New Jersey, said about the operation of his truck farm during last year's serious drought. With a Marlow Sprinkler-Irrigation Pump and a well planned farm pond as crop insurance, Orthman used portable sprinkler-irrigation to get better, more marketable crops.

marlows do the job better!

Marlow Irrigation Pumps are engineered and built specifically for sprinkler-irrigation service. That's why Marlows combine top performance with economy and easy, trouble-free operation. Marlow makes a broad range of models to meet every sprinkler-irrigation requirement. A choice of power units is available, including electric motors, gasoline, L.P.G., or diesel engines. See your Marlow dealer or write for Bulletin SI-53.



How you can save on all your transportation needs with an

"All-Chevrolet" Farm

You're time and money ahead when you make one stop for your cars, trucks, parts and service

Here's why an "All-Chevrolet" Farm is such a sound and sensible answer to your farm transportation needs.

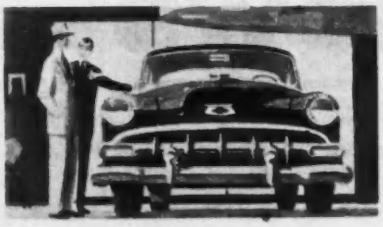
If you went shopping for, say, building supplies, you'd want to go to one place for all your needs.

It's the same way with your farm transportation needs. You can save time by getting your cars, trucks, parts and service from one convenient and specialized source—your Chevrolet dealer. He maintains a modern service department, manned by Chevrolet-trained mechanics. And he keeps a well-rounded stock of Genuine Chevrolet Parts on hand to serve you.

In addition, you're money ahead all the way when you go "All-Chevrolet!" As in years past, Chevrolet is the lowest-priced line of cars and trucks—*both*.

Why not drop in and talk it over with your Chevrolet dealer soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Thrifty "Two-Ton" Handyman Station Wagon
It's a roomy sedan and a rugged cargo carrier all in one! The rear seat can be folded flat to give you extra load space.



Everything you want in the new Chevrolet
New beauty, new power—and new economy, too. It's farther ahead than ever in bringing you the features you want most.

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Your Chevrolet dealer aims to serve all your automotive needs dependably and at sensible prices. See him soon.

MORE PEOPLE BUY CHEVROLET CARS AND TRUCKS THAN ANY OTHER MAKE! CHEVROLET

American Fruit Grower
• Fruit for Health •

Acute water shortage has a more drastic effect on fruit size of peaches than on apples during the period of 30 to 35 days before harvest maturity.

Orchard Irrigation in HUMID AREAS

The benefits derived from irrigation are greater on shallow than on deep soils

By J. R. MAGNESS
U. S. Department of Agriculture

THE widespread drought of 1953 over most of eastern United States and continued subnormal precipitation during the winter months following are causing much concern to fruit growers. Apples and peaches in many orchards failed to attain expected size in 1953 because of water shortage. A number of growers are installing irrigation, and many more are considering the possibilities. Let us look at the problem and the advantages that might come from irrigation in eastern orchards.

Of foremost importance in determining the need for and the probable value of irrigation is the soil. Good orchard soils will store a lot of water available for the growth of deep-rooted trees. In general, coarse sandy soils will store about one-half inch of water available to crop plants for each foot of depth. Fine sands will store about one inch of water per foot. Loams will hold more, generally about one and one-half inches per foot of depth, while clay loams will hold still more, generally about two inches of water available for plant use per foot of depth.

Thus, if your orchard is on a good silt loam with roots four to five feet deep, the soil will store six to eight acre-inches of usable water. On the other hand, even in such a good soil, if rooting depth is limited because of rock, hard pan, or tight subsoil to only one and one-half to two feet, only about three acre-inches of water available to the tree will be stored. A sandy soil will store only about half as much for each foot of depth as a silt loam.

Trees without leaves and other vegetation use almost no water during the dormant season. Thus, over most parts of eastern United States winter precipitation will normally fill the soil to its water-holding capacity in the root zone of the trees even when it is subnormal. A total of 10 to 12 inches of dormant-season precipitation is usually sufficient for this. Thus, most orchards, at least east of the Mississippi River, generally go into the growing season with a reserve, or "bank account," of water, the amount of which is dependent upon the texture and depth of soil in the root zone.

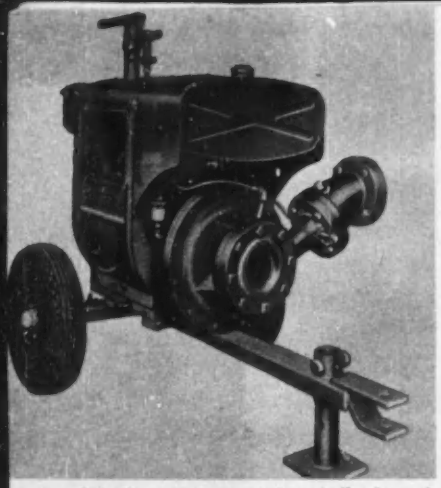
Orchards in the eastern United States will actually use about four inches of water per month during the period of full leaf of the trees, May 1 to September 30, or about 20 inches for the season. If as much as six to eight acre-inches of water are stored in the soil at the beginning of summer, trees suffer for water only during the occasional extremely dry year. On the other hand, if only two to four inches of usable water are stored within the root zone, trees will suffer any time a period of three to four weeks when little or no rainfall occurs.

Apples grow at practically a uniform rate from the time the leaf system is fully expanded in June until they are picking mature. With late-season varieties there is a period of about 100 days when the normal growth rate is very close to one per cent of the final size per day. If a period of drought occurs so that growth is reduced, the size which the fruit loses during such a period is never regained. When moisture is again available after a period of drought the fruit will resume growth at the normal rate. Apple trees have a remarkable ability to recover from the effects of drought, but the fruit size lost during drought is not regained when moisture is again available.

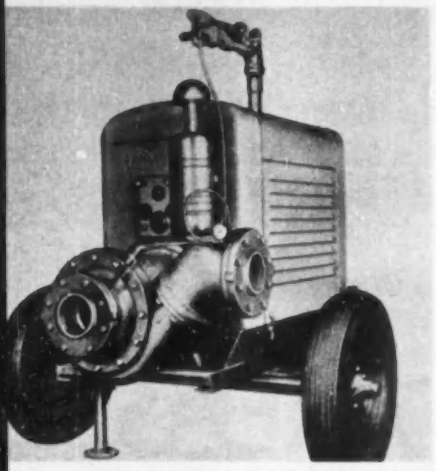
(Continued on page 34)

New Equipment for IRRIGATION

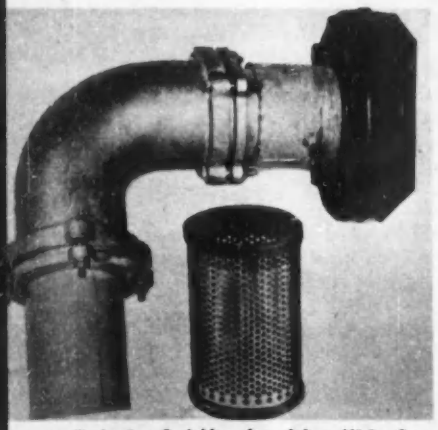
Here are some new models to keep you up-to-date on progress in orchard irrigation equipment . . . .



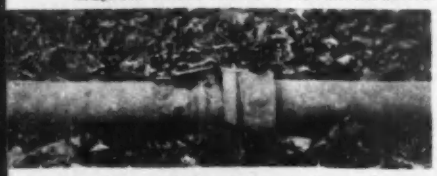
Irrigation pump mounted on trailer is made by The Deming Company, Salem, Ohio.



Rated capacity of Model 5WHI pump of Carver Pump Company, Muscatine, Iowa, is 950 gallons per minute at 90 pounds.

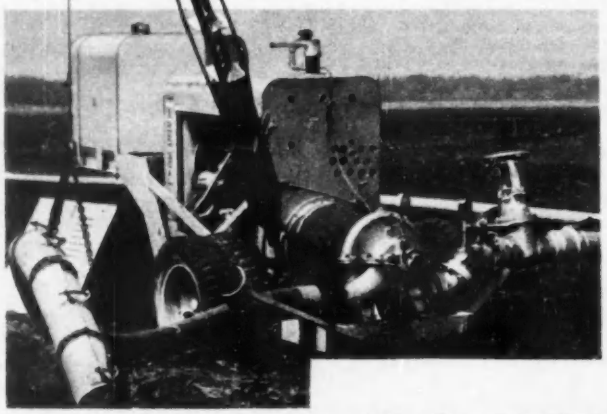


Perfection Sprinkler, Ann Arbor, Mich., Sure-Flo unit is cast aluminum elbow with two couplers. Intake strainer is also shown above.

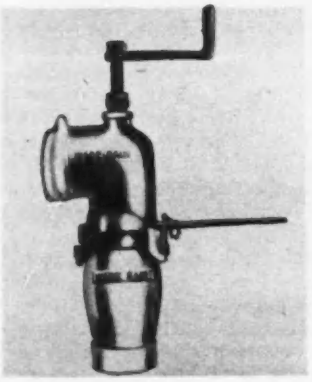


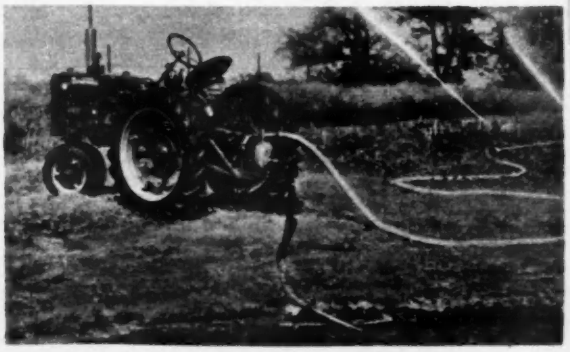
Rubber sealed quick coupling aluminum pipe is product of Chicago Metal Mfg. Co., 3727 S. Rockwell St., Chicago 32. Right—Hydrant valve for use with permanent buried main lines is made by R. M. Wade & Co., Portland 9, Ore.

Above—Model 6F2S sprinkler irrigation pump made by Marlow Pumps, Ridgewood, N.J., using well points for water supply.



Left—Portable centrifugal irrigation pump made by The Gorman-Rupp Co., Mansfield, Ohio, is mounted direct to the motor drive shaft.





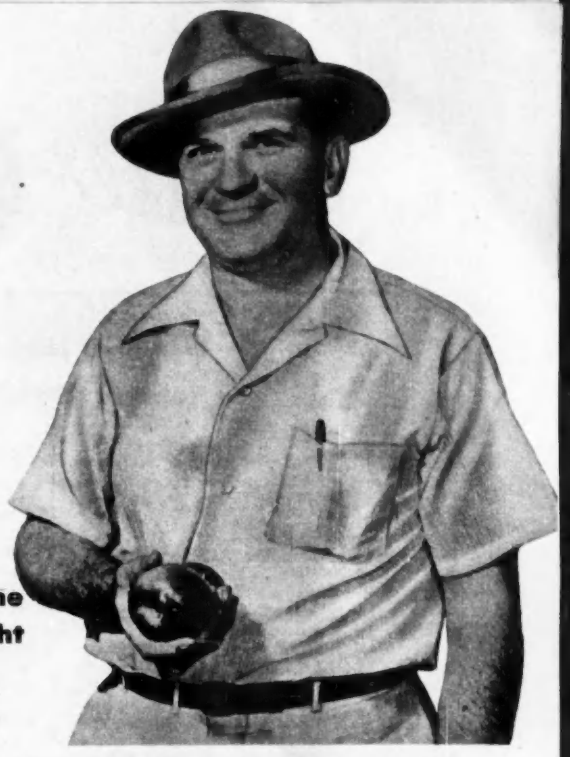
Barnes two-inch self-priming centrifugal tractor-mounted pump with speed increaser, made by Barnes Mfg. Co., Mansfield, Ohio, delivers about 100 G.P.M. at 50 pounds pressure.

Saved . . .

BY A WELL!

Fred Vollenweider had to go down 1,400 feet—but he saved a $25,000 apple crop during last year's drought

By RICHARD T. MEISTER



Fred Vollenweider, Seymour, Mo., likes finish on apples grown under his irrigation system.

FRED VOLLENWEIDER isn't one to sit back and let events take their course. In August, 1947, when he returned home from a Chicago fruit meeting he was faced with ruinously low prices for a fruit crop on which he had lavished considerable time and money. In two weeks time he repaired an old tomato cannery, got together and rebuilt some worn out canning machinery, and started to slice and process apples. This venture saved his skin.

In 1952 at his 120-acre orchard at Exeter, Mo., in Barry County, his apple crop was burning up on the trees. There had been practically no rain since bloomtime. Fred had operated the Barry County orchard for nine years and everyone of those years he had lost part of his crop because of dry periods. But never had he known anything like this. The shallow soil which allows the roots to penetrate only four feet deep was dry. Jonathans from this orchard, which is in an early district, bring premium prices but if the drought continued there would be no Jonathans to market.

Cloudless days continued. The sun beat down unmercifully on trees and fruit. To stave off the loss of his crop, Vollenweider made a deal with a local well driller to go deep into the ground for water. It was a risky undertaking since experienced geologists said it would not be possible to find enough water to make irrigation profitable. But Fred Vollenweider is not one to proceed without experience and facts to back him up. He found out all he could about geological formations in his orchard and he studied the history of all the wells in the neighborhood as well.

On the farm is a well that delivers nine gallons a minute located adjacent to a two-acre peach orchard. Fred had tested sprinkler irrigation on this orchard and found that in 1952 the two acres produced $3,000 worth of fruit while 10 acres close by were a loss.

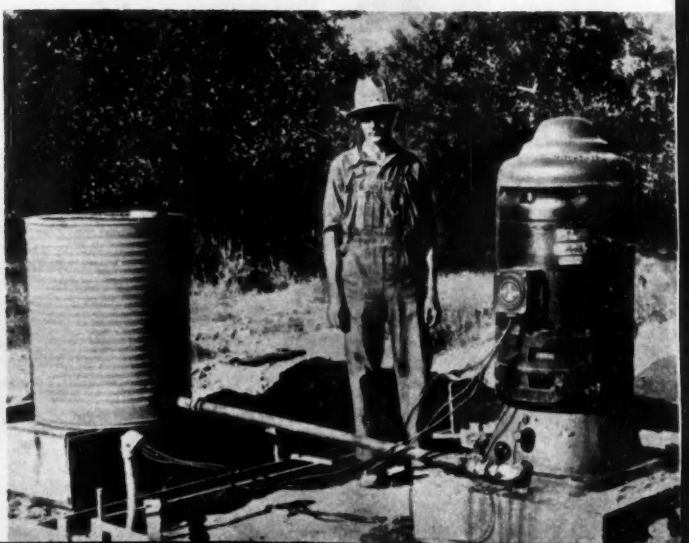
Proceeding from his experience with the peach orchard Fred found that tests run by Aubrey Hibbard at the University of Missouri showed that his soil would hold two and one-half inches of water per foot. Since the soil is only four feet deep, any amount of water over 12 inches would be of no benefit. If he were to apply an inch per acre per hour he would need a well producing 400 gallons per minute.

Anyone who has ever drilled or dug for water knows the suspense—and expense. At 1,000 feet the well driller hit water but only at the rate of 45 gallons per minute. To go farther seemed folly and geologists were getting ready to say, "I told you so." But to Fred there seemed a chance, based on his own investigations, and besides Mrs. Vollenweider backed up his judgment with her

(*Continued on page 30*)

Below, right—Deep well turbine pumps powered by 60 horsepower electric motors provide power for his irrigation system.

Below, left—Irrigating with quick coupling portable aluminum pipe is started when soil moisture reaches the 50 per cent level.



State NEWS

- **Georgia's High Quality Peach Crop Starts for Market**
- **Vermont Growers Fight Scab from the Air**

GEORGIA—One of the cleanest crops in years is being grown in the Georgia peach belt. Plum curculio infestation is very low and only scattering outbreaks of brown rot and bacteriosis are reported. First bushel of Mayflower peaches was sold on the Atlanta wholesale market May 10. Indications are that peach varieties will ripen about three days later than last year and that the following varieties will probably ripen on these dates at Fort Valley:

Hiland, May 25; Dixired, May 31; Early Red Fre, June 10; Dixigem, June 10; Pearson Hiley, June 10; Early Hiley, June 16; Southland, June 23; Sullivan Elberta, June 30; and Elberta, July 8.—*Earl F. Savage, Experiment.*

MASSACHUSETTS—G. Stacy Gay of Three Rivers put some beautiful McIntosh on the market when he opened his controlled atmosphere storage this spring.

There is much interest in this type of storage. A group of growers in the Nashoba area recently visited controlled atmosphere storages in the Hudson Valley, preliminary to considering the advisability of building such a storage co-operatively in their area.—*A. P. French, Sec'y, Amherst.*

CALIFORNIA—Growers are getting a new confidence in miticides with the excellent new array of mite killers, entomologist Francis M. Summers told several hundred peach growers and processors at the recent Canning Peach Day and Clinic on the Davis campus of the University of California.

"The performance of the new sprays," said the Davis scientist, "sets a high standard of performance for us to use in judging new spray materials and their effectiveness. Fewer new compounds are moving into the state of field trials than during the immediate post-war period—but they are better compounds."

Summers also described the progress of new research on the biology and control of San Jose scale, an old pest now recurring in the peach belt. He said that the widely recommended dormant oil sprays give very good results but that adverse weather conditions often interfere with winter spraying. Experiment station entomologists are co-operating with members of the extension service in a search for effective summer or fall sprays.

Dillon S. Brown, pomologist at Davis, told how efforts have been made to calculate probable time of harvest from temperatures during the period of full bloom and immediately thereafter. He was successful in forecasting the beginning of harvest of apricots within three days of the actual dates for 80 per cent of the time when his methods were tested against temperature and harvest information of the past 20 years. He is trying to extend the technique to forecasting harvest dates for other fruits.

VERMONT—Unusually late spring conditions prevailed until the last week in April, during which a succession of high temperature days advanced apple blossom bud development faster than many fruit growers had ever before observed. By May 1 bud development was considered by most orchardists to be at least a full week advanced.

McIntosh crop prospects are lighter in southern counties compared to a year ago whereas in the Champlain Valley area fruit prospects for this variety appear to be better than in 1953. Delicious, Cortland, and Northern Spy are showing unusually light bloom in almost all sections.

A considerable number of growers are planning to use artificial pollination in the larger McIntosh blocks. A high percentage of acreage in the Addison County section is being given scab control by means of airplane application of fungicidal dust.—*C. Lyman Calahan, Sec'y, Burlington.*

PREPACKAGING CLINIC

The Ohio Apple Institute is sponsoring a Roadside Marketing and Prepackaging Clinic as part of their 17th annual membership meeting, which will be held at the Harry Lutz Orchards near Carroll, Ohio, June 24. The program will feature a discussion of roadside marketing and the prepackaging of fruit, especially apples. Commercial exhibitors will display and demonstrate their packaging supplies and equipment. The business sessions of the institute will be held at the Southern Hotel, June 25.

CONNECTICUT—Fruit bloom was two weeks early. Cool weather prolonged the bloom and kept bees from being very active.

H. C. C. Miles, emeritus-secretary of Connecticut Pomological Society for the past six years, died April 28, 1954, at the age of 85. Mr. Miles was born in Milford and that is where he died.

In 1891 Mr. Miles helped to organize the Connecticut Pomological Society. He was its president in 1936, and served as its secretary for 51 years. He also was secretary-treasurer of the American Pomological Society for many years.

Mr. Miles was awarded an honorary certificate of distinction by the University of Connecticut in 1939. In 1941 the pomological society bestowed upon him a similar honor.

(Continued on page 14)

FRUIT PEST HANDBOOK

(THIRTY-THIRD OF A SERIES)

SAN JOSE SCALE

THE San Jose scale is a serious pest of apples in most parts of the United States. It also attacks other deciduous fruits, including pears, peaches, cherries, and plums, berry bushes and many ornamental shrubs, and nut, shade, and forest trees.

The insect sucks the sap from the twigs, branches, fruit, and foliage. Infested twigs and limbs have a roughened and grayish appearance, but the first evidence of infestation is often the small reddish spots that commonly appear at points of attack, particularly on the fruit and tender bark. Other evidences of infestation are the occurrence of dead twigs and limbs and a lowering of the vitality of the trees. A heavy, continuing infestation may result in death of the trees.

All stages of the San Jose scale are present on the trees in the fall but ordinarily only those that are about half-grown survive the winter. These complete growth in the spring. The covering of the full-grown female is nearly circular, about the size of a pinhead, and grayish, with a dark central nipple-like projection, whereas that of the male is somewhat smaller, elongated, and with the nipple toward the small end of the scale. The mature males are tiny gnat-like insects that are active, although they do very little flying.

Underneath the scale-like covering the mature females are yellow and if the infested bark is scraped lightly the yellow crushed bodies of the tiny insects will be

(Continued on page 36)

(Photographs courtesy USDA.)

The three illustrations show: a) San Jose scale on peach branch; b) group of San Jose scale, enlarged; c) Scale on apple.

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FOR APHIDS:	• Nicotine Sulfate Solution • Genithion* P-15 Spray Powder • Malathion 50% Emulsifiable Concentrate • Malathion 25% Spray Powder
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FOR CODLING MOTH:	• Genitox* S-50 and S-75 Spray Powders (contain 50% and 75% DDT) • Lead Arsenate, Standard and Astringent • Genithion P-15 Spray Powder • Malathion 50% Emulsifiable Concentrate • Malathion 25% Spray Powder
FOR RED-BANDED LEAF ROLLER:	• 50% TDE Spray Powder • 25% TDE Emulsifiable Concentrate • Lead Arsenate, Standard and Astringent • Genithion P-15 Spray Powder • Malathion 50% Emulsifiable Concentrate • Malathion 25% Spray Powder

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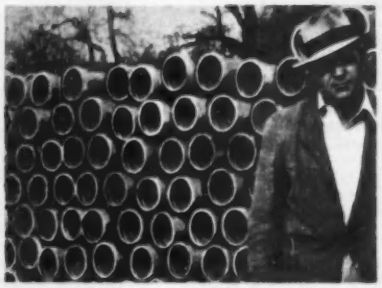
"Sprinkler irrigation saved my business"

Says Fred Vollenweider, Seymour, Missouri



"With portable sprinkler irrigation, I defied drought, saved my apples, saved my business," says Mr. Vollenweider. "We applied 18 inches of water per acre to winter apples from September 1st to October 10th in the fall of 1952. They responded and grew so well we salvaged $25,000 worth of apples in spite of existing drought conditions.

"We now have 420 acres of orchard under portable sprinkler irrigation. We have found that sprinkler irrigation gives extra size and by increasing size from two and three quarters inches to three inches we gain 30% volume. Better color is another advantage."

Mr. Vollenweider's story is typical of what sprinkler irrigation systems are doing for fruit growers in all parts of the country.

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SPRING FROST DAMAGE

THE coldest May Day in the memory of many old-time growers occurred this season in the PACIFIC NORTHWEST. The low at Wenatchee was 23° and at Yakima 27°. In Oregon, it was the coldest ever recorded for May Day in six of the state's largest cities. In parts of Washington's Okanogan Valley temperatures dipped to 18°.

Throughout these areas, growers fired all night with slab wood, sawdust, oil, and apple wood. In the morning, a pall of smoke obscured the mountains in Chelan and several other areas. Heavy smudging cut visibility to less than a block at Medford, Ore., and smoke hung thick over the valley.

Dr. John Snyder, secretary of the Washington State Horticultural Association, reported: "This year's frost in many instances did not follow an anticipated pattern. Orchards normally expected to be safe from frost suffered. Others in which you would expect frost during frost years got by fairly well. Heating seems to have saved some fruit but proved inadequate in many cases.

"Nearly all deciduous fruits including apples, pears, peaches, cherries, prunes, apricots, blackberries, raspberries, and strawberries, felt the effects of low temperatures in late April and early May. It is, of course, too early to estimate the damage. At present many apple orchards have prospects of a normal crop; whereas, the best others can do is to produce a nuisance crop."

In Washington's Puyallup Valley, temperatures of 23° to 25° on May 1 severely injured raspberry and blackberry crops already damaged by a January freeze and a severe frost on April 2. Less damage occurred to strawberries and blueberries. Although it is impossible to make an exact estimate of total damage, C. D. Schwartze and Folke Johnson of the Western Washington Experiment Station and Merrill Delano, Pierce County Extension Service, and Raymond F. Kern of the Washington State Department of Agriculture, estimate that the raspberry and blackberry crops have been reduced by at least 50 per cent. In addition, new canes destined to yield berries in 1955 were killed back almost to ground level. However, there is still time for more new canes to grow from below ground.

The same cold wave coming down from the north seriously damaged crop prospects in MICHIGAN fruit areas. From Grand Rapids south, there was some injury from frost but most important were the days with temperatures in the low 40's and high 30's with fruit trees in full bloom. Flowers deteriorated and growers expect a light set and a heavy drop. From Grand Rapids north, the damage was due more to frost. In the cherry areas of Traverse City, damage was spotted all the way from complete loss to a loss of only 25 per cent of the crop. There are those who say that only 50 per cent of the red tart cherry crop is left.

In the berry areas around Benton Harbor, temperatures went as low as 22° at Sodus and 26° at Paw Paw. Frosts occurred six out of seven nights. Growers with sprinkler irrigation facilities worked through the night to prevent frost damage. Some growers put on as much as seven inches of water. Unprotected strawberries are from 75 to 90 per cent killed, according to County Agent Jerry Mandigo. Those protected by sprinkler irrigation received 100 per cent protection from frost when the grower watched temperatures faithfully and stayed with the job of sprinkling every night.

STATE NEWS

(Continued from page 12)

He originated and contributed generously to a fund for student scholarship in pomology at the University of Connecticut.—*S. P. Hollister, Sec'y, Storrs.*

NEW YORK—Hudson Valley and western New York have been getting plenty of rain and cold weather during blossom. Pollination conditions have been erratic, especially on cherries and apples. Scab is showing up on unsprayed apple leaves and some in sprayed blocks. No freeze damage has occurred except in a few spots on peaches. Bud looks fairly heavy on all apple varieties except Greening which is spotty. Some leaves look yellow due to lack of sunshine and to wet weather.

Considerable shift is taking place, to new-type sprays for disease control and to machinery for cutting and beating up brush in the orchards as a labor- and mulch-saver.—*D. M. Dalrymple, Sec'y, Lockport.*

WASHINGTON—Elon J. Gilbert, president, Washington State Horticultural Association, announces that the association in co-operation with the Washington Agricultural Extension Service, is planning a series of orchard tours and summer meetings. Dates for tours in some areas have not been set, but the week of August 2 promises to be a busy one. The tour will start in Okanogan County Tuesday, August 3. From there it will go to the Tree Fruit Experiment Station in Wenatchee. On August 5 the tour will take in the area around Wenatchee. And from there it will go to Yakima in the heart of the stone fruit area.

Harold Simonds, 72, who retired as extension agent in Chelan County in 1949, died April 11, 1954. Harold had many friends throughout the state, having been county agent in Franklin, Asotin, and Douglas counties previous to his appointment in 1938 as Chelan county agent.—*John C. Snyder, Sec'y, Pullman.*

IOWA—Bloom set is indicated at average to slightly below. Apparently below freezing temperatures on May 2–4 did very little damage. Iowa has been getting some good rains which will help the fruit situation. Subsoil was very dry all fall and winter.—*R. Glenn Raines, Sec'y, Des Moines.*

NEW JERSEY—Peach bloom was good and crop prospects are favorable. Considerable tree damage occurred from cold weather in January. Temperatures went as low as —20°F. in some parts of the state but were not so low in central and southern counties where most of the injury occurred. Bark splitting on trunks and in crotches has occurred. Injury is sufficient to reduce yield considerably in many orchards. Damage to buds is not serious.

Apple bloom was heavier than expected following the dry 1953. Pollination weather was excellent from central Jersey south. Blueberry bloom was heavy and a fine crop is in prospect. Strawberry harvest will be lighter because of poor fields.—*E. G. Christ, Sec'y, New Brunswick.*

MINNESOTA—Considerable winter injury occurred to red raspberries and present prospects indicate not more than one-third of a normal crop. Prospects for strawberries are for an average crop. It is too early to estimate apple crop prospects.—*J. D. Winter, Sec'y, St. Paul.*

MARYLAND—The dry weather was taken care of by several heavy rains that were timely and gratefully received. Peach and apple bloom came on heavily and in general pollination was excellent. There was some freezing weather in early May but no damage resulted. Growers had about completely controlled diseases and insects up to the second week of May. *A. F. Vierheller, Sec'y, College Park.*

MAINE—Trees are very well budded, although no abnormally large crop is evident. A six-day rain starting May 2 caused a hazardous situation with regard to scab.

Lewis Berry & Sons of Livermore Falls are the first growers in the state to adopt the pallet system of handling apples from tree to storage. A fork-lift is used in the storage. Having enlarged their storage last fall, and with new orchards coming into bearing, they find this

(Continued on Page 16)

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NEW TYPE IRRIGATION PUMP INCREASES COTTON YIELD

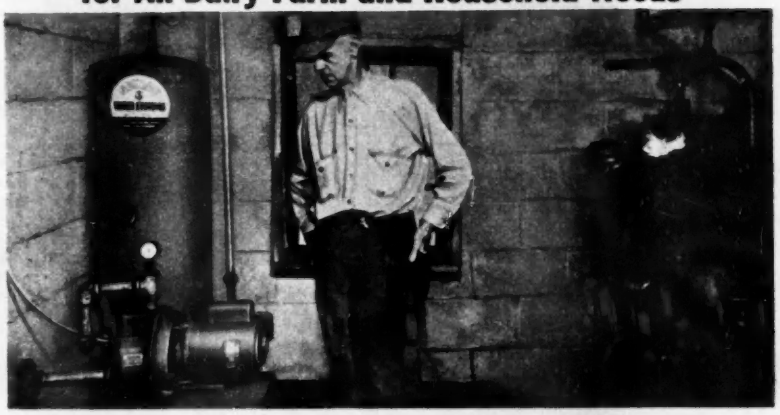
Pump company representative checks new design deep well pump on Mr. Olsen's farm.

Mr. Eric N. Olsen of Fresno, California, sprinkler-irrigates his 75 acres of cotton with new design deep well pumps. "I've found that I get better use from the same amount of water since these new type pumps were installed, which means increased yield and additional profit," says Mr. Olsen.

These pumps raise the water from wells and drive it through the pipes and out the sprinkler system at better than 40 pounds pressure, all in one operation. This means no booster pumps are needed for sprinkling.

Mr. Olsen's pumps are of the deep well turbine type, but they have a special impeller mounted in the pump head at ground level. This impeller does the work that would otherwise require three or four extra turbine bowls. These new sprinkler pumps are powered by dependable General Electric motors. For additional information check "deep well pump" on coupon.

New Water System Delivers Plenty of Fresh Water for All Dairy Farm and Household Needs



Mr. Porter is shown with his labor-saving water system. He gets 300 gallon per hour capacity with this pumping arrangement.

Mr. Alvan B. Porter and son Carl of Apulia, New York, never worry about having an adequate supply of fresh running water available—their new fully-automatic water system provides "city water service" for all of their 55-acre dairy farm needs. As Mr. Porter says:

"I'm thoroughly pleased with my pump's operation and find it can take care of my barn and household needs without any strain. My cows have plenty of drinking water in front of them all the time. I hardly ever go near the pump—once in a while I look at the water-pressure gauge".

In addition to furnishing the daily water requirements for 28 head of livestock, the Porters' water system supplies drinking and household water for their 12 room house with inside bath.

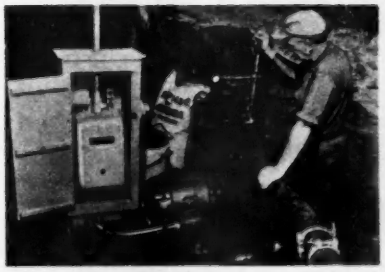
Powered by a G-E motor with built-in overload protection, this pump unit provides ample water for cleaning barns, tractors, farm implements and the automobiles. Mr. Porter washes his manure spreader every day and it still looks like new after three years of hard use. For more information check "water systems" on coupon below.

OREGON FARMER DOUBLES GROSS WITH SPRINKLER IRRIGATION SYSTEM

Mr. Carl Sande, Star Route, Forest Grove, Oregon, one of the most successful crop farmers in the region says: "I double my gross profits by using a sprinkler irrigation system". Mr. Sande irrigates 30 acres of land from a creek with the pump shown below. This pump supplies 360 gallons per minute at 70 pounds pressure. It is driven by a G-E close-coupled 20 hp motor. The motor is protected by a rugged G-E motor starter.

A big advantage is that Mr. Sande can have automatic starting and stopping of his irrigation since the pump is also equipped with a G-E time switch. He can put it on a new setting last thing at night and go to bed with confidence that the G-E time switch will shut it off at the predetermined time. For information check "sprinkler system" on coupon.

Sprinkler irrigation gives uniform distribution of fertilizer while irrigating.



Mr. Sande adjusts valve to feed right amount of ammonium sulphate into water.

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- ☐ Irrigation Pump
- ☐ Sprinkler System
- ☐ How To Choose Your Motor

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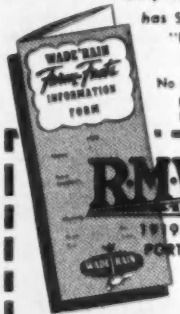

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STATE NEWS

(*Continued from page 14*)

method of handling apples not only causes less bruising but increases efficiency of harvest operations.

Dr. F. H. Lathrop of the Maine Agricultural Experiment Station has asked to be relieved of his duties as head of the entomology department. Dr. Lathrop will continue his studies on the control of orchard insects.—*F. J. McDonald, Sec'y, Monmouth.*

Ideas: The New Hampshire Horticultural Society at its recent annual meeting served a smorgasboard luncheon of 20 dishes containing apples in some form. Growers liked it just fine.

OHIO—A new Special Day—Small Fruits Day—has been instituted by the Ohio Agricultural Experiment Station. Sponsored by the department of horticulture, the event is scheduled for Friday, June 18, at Station Grounds, Wooster. The program has been planned to interest both commercial grower and home gardener.

The program will start at 9:30 A.M. and conclude at 3:30 P.M., E.S.T. Morning program will include tours and discussions of different phases of small fruit research at the experiment station, such as chemical weed control and varieties of and cultural procedures for grapes, raspberries, blueberries, and strawberries, with special emphasis on the latter. The afternoon will be devoted to a speaking program with one of the highlights a discussion by Dr. W. A. Gould on the frozen preservation of small fruits. Irrigation and marketing will also be covered. Educational and commercial exhibits are planned.—*R. G. Hill, Jr., Dept. of Hort., Wooster.*

INDIANA—Good bloom has occurred on all varieties and pollination weather has been good. Blossom blight is reported serious in some orchards. Some frost damage occurred in early May in a few scattered apple orchards, and quite extensive damage seems to have occurred to strawberries. Growers have delayed thinning sprays because of cold weather.

Drought seriously affected fruit trees last year, especially those in the southern half of the state. One of our larger growers near Vincennes had to remove over 20 acres of older trees because of drought injury. There were too many dead trees and limbs in the orchard to leave it as an economical producing unit.

Subsoil is still very dry and we need more moisture than normal to produce a good crop of fruit in 1954.

C. R. McCollom, Henderson, well-known representative of the Niagara Chemical Company covering the southern half of Indiana, died May 1. He was owner of the Funk Orchard at Vincennes and president of Knox County Horticultural Society, Vincennes.—*R. L. Klackle, Sec'y, Ind. Society, West Lafayette.*

COLORADO—Research on production problems of tree fruits is a major project at the Western Slope Branch Station, Colorado Agricultural Experiment Station, Austin. Apples, pears, peaches, sweet and sour cherries, plums, prunes, apricots, and grapes are grown at the station. To give growers an opportunity to view the various experimental plots and be advised as to the latest findings from the different projects, an annual field day is held. The date for this year's field day is July 22.—*Ferris M. Green, Supt., P.O. Box 439, Austin.*

CANADA—Unseasonable frost, lying heavy over the orchards of British Columbia's Okanagan Valley in early May, destroyed an estimated 95 per cent of the cherry, apricot, and peach crops in some areas. Hardest hit is the southern area, a source of much of the famed Okanagan soft fruit crop, 200 miles east of Vancouver. Last year the British Columbia tree fruit crop was worth $17,150,000.—*George F. Tolen.*

CALENDAR OF COMING MEETINGS AND EXHIBITS

June 2—Illinois State Horticultural Society summer orchard day, Harvey Hartline Farm, Carbondale. Harold J. Hartley, Sec'y, Carbondale.

June 15-17—South Dakota State Horticultural Society annual meeting in joint convention with affiliated State Federation of Garden Clubs, Dell Rapids.—S. A. Simmons, Sec'y, Sioux Falls.

June 17-19—National Apple Institute annual meeting, Niagara Falls, N. Y.—Truman Nold, Sec'y, 726 Jackson Place, Washington 6, D. C.

June 18—Small Fruits Day, Ohio Agricultural Experiment Station, Wooster.—C. W. Ellenwood, Dept. of Hort., Wooster.

June 22-24—Pacific Branch, Entomological Society of America, 2nd annual meeting, Pilot Butte Inn, Bend, Ore.—Chas. H. Starker, Press Chairman, P.O. Box 3819, Portland 8, Ore.

June 24—Ohio Apple Institute 17th annual membership meeting, featuring roadside marketing and prepackaging clinic, Harry Luts Orchards near Carroll, Ohio. Business sessions at Southern Hotel, June 25.—Howard M. Wells, Mgr., 107½ W. Main St., McArthur.

July 14—Massachusetts Fruit Growers Assn. summer meeting, University of Massachusetts, Amherst.—A. P. French, Sec'y, Amherst.

July 21—University of Connecticut fruit growers' day, Storrs.

July 22—Annual Field Day, Western Slope Branch Station, Colorado Agricultural Experiment Station, Austin.—Ferris M. Green, Supt., P.O. Box 439, Austin.

Aug. 10-12—Ohio Pesticide Institute summer tour, beginning at Wooster and finishing in northwestern Ohio. Dinner on the 10th will commemorate 100 years of entomology.—J. D. Wilson, Sec'y, c/o Ohio Agr. Exp. Sta., Wooster.

Aug. 16-22—Citrus Growers Institute 21st annual meeting, Camp McQuarrie, Ocala National Forest, Ocala, Fla. Arranged and directed by University of Florida Agricultural Extension Service, Gainesville.

Aug. 23-27—Centennial of Farm Mechanization, Michigan State College, East Lansing.—A. W. Farrall, Head, Agr. Engng. Dept., East Lansing.

Aug. 27—Four-state joint summer meeting (Md., Pa., W. Va., Va.), in Timberville section of Rockingham County and Mt. Jackson section of Shenandoah County in Virginia. Host; Virginia State Horticultural Society.—John Watson, Sec'y, Va. Soc., Staunton.

Aug. 29-Sept. 1—International Apple Association 60th annual convention, Hotel Chinook, Yakima, Wash.—Norbert Eschmeyer, Sec'y, Public Relations & Promotion, 1302 18th St., N.W., Washington 6, D. C.

Sept. 25-26—Calhoun County Apple Festival and Illinois State Fruit Queen Contest.—Harold J. Hartley, Sec'y, Hort. Soc., Carbondale.

Oct. 3-5—Produce Packaging Association 4th annual conference and exposition, The Shoreham Hotel, Washington, D. C.—Robt. A. Cooper, Exec. Sec'y, 500 Fifth Ave., New York 36, N. Y.

Oct. 20-22—Florida State Horticultural Society 67th annual meeting, Miami Beach.—Ernest L. Spencer, Sec'y, Bradenton.

Oct. 21-30—National Apple Week (Oct. 30, National Apple Day).—National Apple Week Assn., 1302 18th St., N.W., Washington 6, D. C.

Nov. 4-5—Minnesota Fruit Growers Assn., and Wisconsin State Horticultural Society joint annual meeting, Winona, Minn.—J. D. Winter, Sec'y, Minn. Assn., University Farm, St. Paul 1.

Dec. 1-2—Connecticut Pomological Society annual meeting, Hotel Bond, Hartford.—S. P. Hollister, Sec'y, Storrs.

Feb. 9-11, 1955—Ohio State Horticultural Society annual meeting, Neil House, Columbus.—C. W. Ellenwood, Sec'y, Wooster.

Fruit Production at a Glance

	Average 1942-51	1952	USDA May 1, Est. 1953
	Thousand Boxes		
Oranges			
Calif., all	46,265	45,530	33,900
Florida, all	55,080	72,200	86,700
Other States	4,665	1,950	2,100
Tangerines	4,340	4,900	5,200
Grapefruit	51,246	38,360	45,220
Lemons	12,722	12,590	14,400

THE QUESTION BOX

Once I read about a chemical used to destroy stumps. As I recall, the preparation is poured into holes bored into the stumps which in turn is supposed to speed up the wood decay. Can you give me the name of this preparation?—*Texas*

So far as is known, there is no practical way to hasten the natural decay of a stump once it is dead. The rate of decay will depend on the species. Decay-resistant stumps like white pine and hemlock will last for decades. Of course, making sure the stump is dead will hasten decay. A combination of 2,4-D or 2,4,5-T may be used for this purpose.

Last year I experienced a bad case of fruit cracking on my plums, particularly with the Fellenburg variety. Could you tell me what causes cracking and what can be done, if anything, to avoid it?—*New Jersey*

Cracking and splitting of fruit is due to a condition of too high an atmospheric humidity or the presence of too much moisture in the soil at certain seasons. These disorders are most likely to occur shortly before maturity when rains follow a period of drought during which the fruit has been checked in its growth. Apparently the checking of growth is accompanied by changes in the fruit skin which render it less elastic so that when growth processes are accelerated during and following a rain it is unable to expand rapidly enough to make provision for the developing tissues within. About the only way you can eliminate this cracking would be to assure your trees of a normal supply of moisture. Perhaps sprinkling during the dry periods would accomplish this result.

Could you give me the cost per acre of an apple orchard on which to base depreciation? —*Missouri*

It is a difficult thing to determine the cost of an apple orchard since so much depends on what has been done to the orchard. In law suits regarding the value of an orchard, we have found that the procedure is to start with the figure $1 for each year the tree has been planted and then to work both ways from that figure until one arrives at an equitable figure, depending upon how well the orchard is kept up and how old it is.

What are the pros and cons of the Redskin peach?—*New York*

According to experience in Maryland, more growers like the Redskin each year. It is thick fleshed, has a small seed, and has good color and a fine flavor, although the tree tends to be a little on the willowy side. It is also very hardy in bud. Its faults spring from just one characteristic—it is a very heavy bud setting variety, a vigorous grower, and has a tendency not to thin itself nutritionally to as large extent as Elberta. Thus, on thin soil and even more so if closely planted, with a grower who doesn't thin reasonably early and carefully, it will be short on size when moisture conditions are inadequate. It will size up an amazing number of fruits satisfactorily and each will be almost uniform in size regardless of load, but they will have to be taken off as a rule.

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above all other fruit fungicides

Over the past 12 years "Fermate" has outperformed all existing fungicides. The new fungicides, now on the market, don't have the "proved-in-the-orchard" experience to compare with the data carefully compiled by experiment stations and growers on "Fermate" ferbam fungicide.

"Fermate" is the mild, protective fungicide that lets trees grow almost disease-free, without shocking them into biennial bearing habits or loss of vigor.

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"Fermate" gives better fruit quality—doesn't burn or scald trees preventing blemishes—keeps apples firm with good storing qualities.

"Fermate" builds up orchard productivity. Here's the most important benefit of all . . . year by year "Fermate"-sprayed trees increase in yield and vigor, foliage color and fruit set. This means a cumulative benefit from using "Fermate" added to the specific advantages listed above.

On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

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MULCH *to hold* Soil Moisture

A mulch soaks up rain like a sponge

THERE are some fruit growing sections that cannot profitably enjoy the benefits of irrigation. The tremendous amount of water required to irrigate land and the insufficient water sources preclude irrigation of a relatively large proportion of fruit plantings. When this is the circumstance, a good mulch can be a partial substitute for irrigation under most conditions; in fact, except for irrigation, mulching is the best known method of maintaining adequate soil moisture under situations of moisture stress.

In areas that depend on rainfall for the soil moisture supply, a heavy mulch of hay, straw, corn fodder, or other plant residues, provides an effective means of trapping rain water. With a well-established mulch there is little or no run-off even though the downpour may attain "gully washing" proportions.

Conditions the Soil

Aside from mechanical retention of water and a natural affinity of decomposing organic matter for moisture, a mulch conditions the soil so that better water penetration and aeration take place. It has been found that the infiltration rates of water into certain clay soils under mulch are over five times greater than the rates without mulch.

Thus, all the water that falls is retained under adequate mulch, and this may be sufficient to supply the tree during periods of moderate drought. Under conditions of severe and prolonged drought it was found that the reduction in fruit growth rate of apples started later on mulched trees than on unmulched ones, and the fruit was larger at harvesttime.

In addition to the prevention of soil compaction, mulching also contributes to soil-moisture conservation by slowing down surface evaporation and by discouraging the growth of grass and weeds. In general, mulching, because of its many favorable influences on tree growth and production, is a management practice that should receive serious consideration by fruit growers who are unable to irrigate but who are in a position to obtain the necessary materials for mulching.—*C.P. Harley, USDA.*

Watch for our July DIRECTORY Issue

Know Your WATER RIGHTS

Mill Act covers reservoirs in the state of Massachusetts

IN the cranberry section of Massachusetts (southeast) large quantities of water are used for irrigation and for frost protection. Much water comes from small ponds and from reservoirs.

Ponds of less than 10 acres may be controlled by purchase of the surrounding land. Reservoirs may be purchased outright or they may be established by the Mill Act which is an act taken from English law. Under this act an owner may construct a dam on his property and flood the land above him. Then through court action and the payment of damages he may acquire the flooded land for a reservoir. This was a common method of establishing mill ponds and reservoirs many years ago in Massachusetts and other New England states.

State-Controlled Ponds

Nearly all ponds of more than 10 acres are controlled by the state. To obtain water from a state pond the property owner must obtain a license and a permit to put a flume or pipe into the pond to withdraw the water. The level of the water in state ponds cannot be raised above a level set for that particular pond or lowered below a level set for that pond. These levels are controlled by a commission which has the authority to change these levels slightly from season to season.

The water table is within a few feet of the surface in all cranberry sections and some growers have driven wells to pump water for sprinkler irrigation and for frost protection. There is no legal limit to the amount of water that may be removed by pumps.

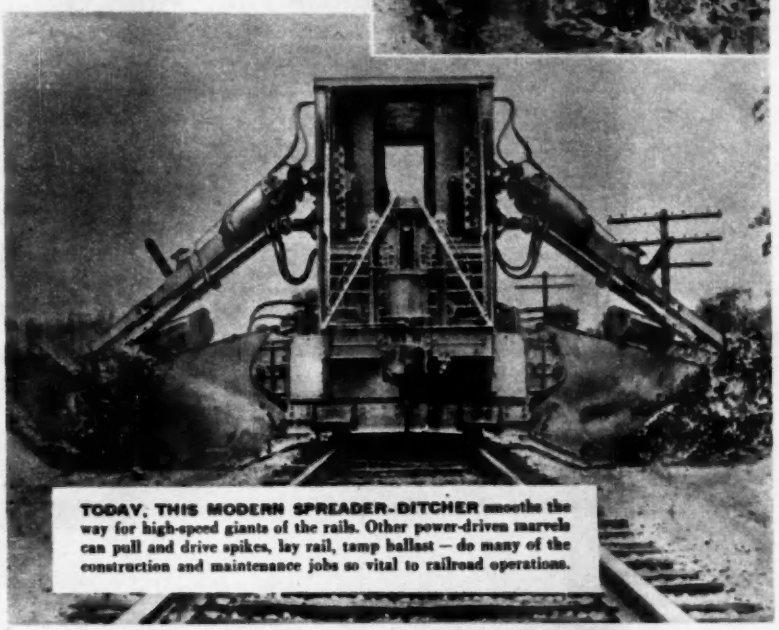
After irrigation of cranberries there may be a large quantity of water to be released and this must be done in a manner which will not do damage to the property below or to cause ponds below to be raised too high.

Besides the legal aspect there is a social obligation which must be considered. Many of the ponds have cottages on the shore and the residents do not like to have the shore line changed. The sportsman should also be considered. A trout stream passes through a number of bogs or the surplus water may go into a fish pond. The improper use or release of water following application of insecticide may be detrimental to fishing.

The legal aspects of obtaining water for irrigation purposes are not the same in all states and it is well to consult a lawyer or members of water control commissions.—*F. B. Chandler, University of Massachusetts.*

The Railroads opened the way for America's growth...

THESE TINY MULE-DRAWN SCRAPERS were photographed long ago as they smoothed a path for a railroad line across the plains. With such primitive equipment, railroad pioneers conquered the vast distances of the continent — and America's growth began.



TODAY, THIS MODERN SPREADER-DITCHER smooths the way for high-speed giants of the rails. Other power-driven marvels can pull and drive spikes, lay rail, tamp ballast — do many of the construction and maintenance jobs so vital to railroad operations.

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The America in which we live has grown and prospered along paths pioneered by its railroads — and pioneering still goes on. Just since the end of World War II, the railroads have spent more than $9,000,000,000 on improvements. And they are going ahead with their improvement program.

As a taxpayer, you will be glad to know that the money to pay for the new and better tracks, terminals, signals and all the rest — as well as new cars and locomotives — is raised by the railroads. None of it comes from your taxes.

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American Fruit Grower
WESTERN SECTION

Sprinkler Irrigation in WESTERN ORCHARDS

Certain areas and certain crops are particularly well suited to this method of applying water

By A. H. HENDRICKSON and F. J. VEIHMEYER
University of California

THE USE of sprinkler irrigation in deciduous orchards in California has increased very rapidly in recent years. This system of irrigation has much to recommend it, but has some disadvantages and also some engineering problems still to be worked out. Broadly speaking, it seems to be well adapted to areas of sandy or shallow soils and where the uneven topography of the area makes it difficult to secure uniform distribution of water by surface methods.

California growers have also found it advantageous for certain nut crops that are harvested from the ground with machines designed for this purpose. With fruits that are picked from the trees in orchards that are properly graded, sprinkler irrigation offers no advantages over the conventional surface methods. Sprinkler irrigation is well adapted to situations where only small streams of water are available.

A knowledge of the water-holding properties of the soil in the orchard to be irrigated is extremely useful, so that the water may be applied when needed without waste. The concept of the soil as a reservoir of water is useful in this connection.

As soon as the leaves appear, the tree begins to draw water from this reservoir, and continues to do so until the supply is exhausted, unless it is replenished from time to time by rain or by irrigation in those regions having rainless summers. The upper limit of readily available moisture is a constant known as the field capacity and is that soil moisture condition which exists after drainage has materially decreased, or about two or three days after a rain or an irrigation. The lower limit of readily available moisture is known as the permanent wilting percentage and is that moisture content from which the plant can no longer secure water rapidly enough to function normally.

Pump installation in a small reservoir, used for sprinkling orchard in background.

Sprinkler irrigation in an almond orchard, using aluminum pipe and undertree sprinklers.

The amount of water that can be readily extracted by plants varies with the type of soil, generally being small in sands and large in loams and clay loams. Orchards on sandy soils show effects of a dry spell sooner than those on heavier soils having a larger supply.

In regions of rainless summer, the exhaustion of the supply of readily available moisture is taken as a matter of course and provision is made to replenish the supply from time to time by irrigation. In humid regions, replenishment depends upon rainfall, and sooner or later a dry season occurs

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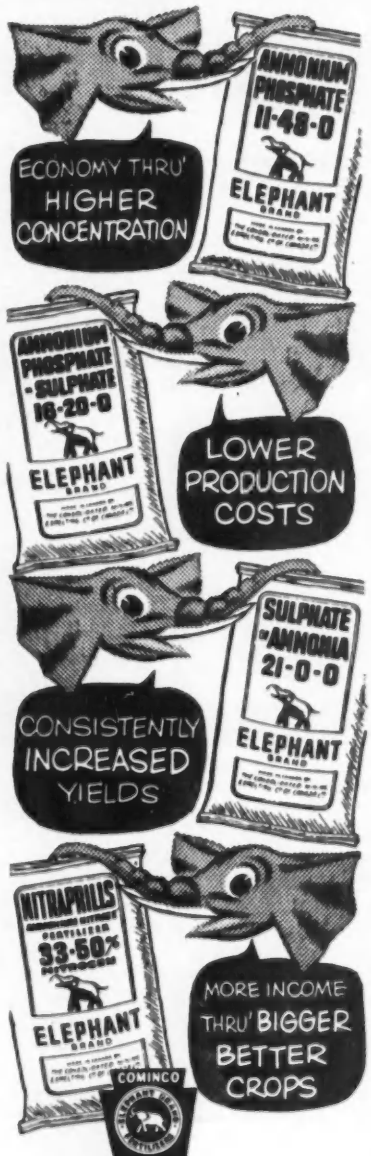

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IT PAYS TO FERTILIZE

with its reduction in size of fruit and yields and sometimes with some damage to the trees. The only answer to the last situation is irrigation.

Water Needs of Trees

The amount of water used by a mature orchard is larger than most people realize. Last summer we made a study of the use of water by a 10-year-old almond orchard on a deep alluvial soil. Soil samples were taken to a depth of nine feet every two weeks between the middle of April and the last of September. The weather was rather cool and cloudy during April and May and the trees transpired a little less than 0.1 inch per day.

Between the first week in June and about the middle of August the use jumped to an average of approximately 0.3 inch per day. This is equal to about 34 tons of water per acre, or about 27,200 gallons. Thereafter, because of cooler, shorter days and the loss of some leaves, the use of water decreased quite rapidly. During the long, warm days of midsummer this orchard was using the equivalent of about nine inches of rain a month. Knowing the amount of water in the soil and the amount used each day, it was easy to calculate how much water was needed and when to apply it.

Measurements of plum and pear fruits throughout the growing season showed that these fruits grew at the same rate and attained the same final size whether grown under sprinkler or surface irrigation. The result depended upon the maintenance of a continuous supply of available moisture, and not upon the method used.

Sprinklers are now being used in orchards of many different fruits, and are found to be advantageous in areas of sandy or shallow soils or in regions where slopes are sufficiently steep to make erosion an important problem. When the depth and water-holding properties of the soil are known, it is comparatively easy to apply enough water to wet the soil to the desired depth without waste. If erosion causes concern, the rate of application may be adjusted so that the water sinks in as fast as it is applied. In foothill orchards the use of sprinklers assures a more nearly uniform application of water than is ordinarily attained by surface methods.

Some California growers have found that the use of sprinklers in almond or walnut orchards permits them to prepare a firm, smooth surface that aids mechanical harvesting.

Sprinkler systems are often designed for a 12-or 24-hour run; the former time period seems to be preferred. This permits moving the pipe once or twice a day, provided the pipes can be shifted at the end of the run.

The hourly rate of application is usually adjusted to the character of the terrain and to the kind of soil. Some soils are able to take water faster than others and, of course, the application in rolling country should not be so fast as to cause some of the water to run down the slope. If penetration presents no problem, a rate of about 0.3 inch per hour seems to be suitable for some loam soils, but this rate may have to be reduced on clay loams and clays. Assuming a 12-hour run at 0.3 inch per hour, the total application would be approximately 3.5 inches over the sprinkled area.

How does a 3.5 inch application of water work out with respect to the interval between irrigations, or how soon will another irrigation be necessary? Two examples will illustrate this point. In one orchard on a loam soil, this amount of water penetrated to a depth of from two to four feet, depending on how much residual moisture from the winter rains or previous irrigation remained. Toward the end of the season, it seldom penetrated more than 2.5 feet.

In another orchard on a rather coarse sandy loam soil, the same amount of water (3.5 inches) penetrated to between three or four feet at each irrigation. In the latter case, bedrock prevented root growth below this depth. All the soil occupied by roots was wetted by each irrigation.

A simple calculation shows that this amount of water was used every 12 days during midsummer. Fortunately, this orchard was equipped so that it could be covered in this interval. In the former case, the owner could only irrigate with a longer interval between applications. As a result, his trees began losing their leaves late in August.

Know the Facts

These examples illustrate some of the points to be studied in planning a layout for sprinkler irrigation in orchards. It is essential to know the waterholding properties of the soil, and the rate of use of moisture by the trees, particularly during the long hot days of midsummer, in order to plan for an installation that will provide adequate irrigation. Changes after the equipment is installed may be difficult and costly. The relative costs of sprinkling and surface irrigation should be given attention.

In conclusion we may say that while sprinklers in orchards have solved some problems, they have introduced others. The principal disadvantages seem to be a tendency to apply insufficient water to wet the soil to the depth containing most of the roots, the lack of uniform distribution where low hanging branches are present, and the difficulty in moving the pipe in clean cultivated orchards where the soil is comparatively heavy. THE END

CONTROLLED FERTILIZATION

Californian meters fertilizer solution into irrigation water

By F. LELAND ELAM

FRED FOOTE, supervisor at the Lemoneira Ranch near Santa Paula, Calif., has devised a method of making his own liquid fertilizer on the ranch and distributing it through irrigation water to his trees on an even basis.

The water supply for the orchards is so arranged that each well and pump take care of a designated number of acres. Mr. Foote has erected a liquid fertilizer dispensing unit near each source of water.

The unit is comprised of a wooden tank in which 100-pound sacks of ammonium nitrate or calcium nitrate, depending on which is needed, are dumped and mixed with water. Two

Fred Foote checks solution in fertilizer tank. Fertilizer solution from tank is metered into water distribution pit shown in foreground. Water goes into three different irrigation lines from tank or pit.

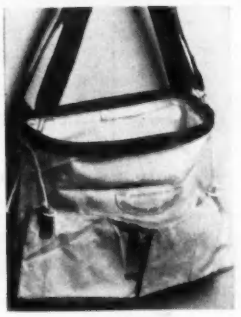
battery boxes, one above the other, are placed in a chamber under the tank for metering the fertilizer solution to the irrigation water. The top box has a float in it, and this keeps the concentrated fertilizer at the same level in the box no matter how much is in the tank.

On one side of the battery box is mounted an aluminum swivel outlet onto which a small curved aluminum pipe is attached. By swinging the pipe up or down the amount of concentrate released from the tank is controlled. As the pipe is swung forward the liquid flows out into the second battery box which releases it into the irrigation water.

The nitrate content of the orchards soils is determined once a month, so that when it is time to irrigate the amount of nitrogen fertilizer to be put into the irrigation water can be adjusted for a particular section of the orchard. The rate of flow of the fertilizer generally varies from one-tenth to one-eighth gallon per miner's inch of water.

The tanks are designed to hold enough material for 24 hours' use, thus requiring the mixing of a new concentrated solution each morning during irrigating periods. The powdered fertilizer is dumped into the tanks and stirred until dissolved in the water. It takes 100 pounds of fertilizer and 16 gallons of water to make 25 gallons of concentrated solution.

Foote's method eliminates the possibility of trees getting too high a nitrate content at one time, the trees receive an even distribution of fertilizer, there is no fertilizer waste, and the cost of labor for making application by machines is eliminated. Also, about 40 per cent saving is made in material. The rate of application is controlled by the irrigator. THE END



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AUTOMATIC PUMP PROVIDES "CITY WATER SERVICE"

NEW TYPE IRRIGATION PUMP INCREASES COTTON YIELD

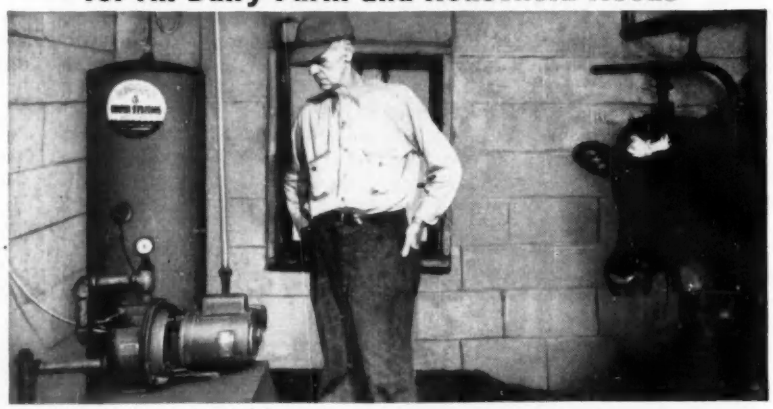
Pump company representative checks new design deep well pump on Mr. Olsen's farm.

Mr. Eric N. Olsen of Fresno, California, sprinkler-irrigates his 75 acres of cotton with new design deep well pumps. "I've found that I get better use from the same amount of water since these new type pumps were installed, which means increased yield and additional profit," says Mr. Olsen.

These pumps raise the water from wells and drive it through the pipes and out the sprinkler system at better than 40 pounds pressure, all in one operation. This means no booster pumps are needed for sprinkling.

Mr. Olsen's pumps are of the deep well turbine type, but they have a special impeller mounted in the pump head at ground level. This impeller does the work that would otherwise require three or four extra turbine bowls. These new sprinkler pumps are powered by dependable General Electric motors. For additional information check "deep well pump" on coupon.

New Water System Delivers Plenty of Fresh Water for All Dairy Farm and Household Needs



Mr. Porter is shown with his labor-saving water system. He gets 300 gallon per hour capacity with this pumping arrangement.

Mr. Alvan B. Porter and son Carl of Apulia, New York, never worry about having an adequate supply of fresh running water available—their new fully-automatic water system provides "city water service" for all of their 55-acre dairy farm needs. As Mr. Porter says:

"I'm thoroughly pleased with my pump's operation and find it can take care of my barn and household needs without any strain. My cows have plenty of drinking water in front of them all the time. I hardly ever go near the pump —once in a while I look at the water-pressure gauge".

In addition to furnishing the daily water requirements for 28 head of livestock, the Porters' water system supplies drinking and household water for their 12 room house with inside bath.

Powered by a G-E motor with built-in overload protection, this pump unit provides ample water for cleaning barns, tractors, farm implements and the automobiles. Mr. Porter washes his manure spreader every day and it still looks like new after three years of hard use. For more information check "water systems" on coupon below.

OREGON FARMER DOUBLES GROSS WITH SPRINKLER IRRIGATION SYSTEM

Mr. Carl Sande, Star Route, Forest Grove, Oregon, one of the most successful crop farmers in the region says: "I double my gross profits by using a sprinkler irrigation system". Mr. Sande irrigates 30 acres of land from a creek with the pump shown below. This pump supplies 360 gallons per minute at 70 pounds pressure. It is driven by a G-E close-coupled 20 hp motor. The motor is protected by a rugged G-E motor starter.

A big advantage is that Mr. Sande can have automatic starting and stopping of his irrigation since the pump is also equipped with a G-E time switch. He can put it on a new setting last thing at night and go to bed with confidence that the G-E time switch will shut it off at the predetermined time. For information check "sprinkler system" on coupon.

Sprinkler irrigation gives uniform distribution of fertilizer while irrigating.

Mr. Sande adjusts valve to feed right amount of ammonium sulphate into water.

GENERAL ELECTRIC COMPANY
Section 330-1E, Schenectady 5, N. Y.

I would like additional information on the following equipment.

- ☐ Automatic Water System
- ☐ Irrigation Pump
- ☐ Sprinkler System
- ☐ How To Choose Your Motor

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WINDFALLS

It is said that Isaac Newton while sitting under an apple tree was struck on the head by a falling apple. Thus he conceived the great truth of his Law of Gravitation.

A FORUM ON THE HUMAN SIDE OF ORCHARDING

Led by HENRY BAILEY STEVENS

Are We Promoting Snobbery? "YOUR attempt to lift our brows and get us to discuss Culture may flatter us," writes William B., from Coral Gables, Fla., "but I wonder! From my observation of numerous cocktail and tea parties on the subject, I'm afraid that, if you succeeded, you would turn a lot of honest fruit growers into prize snobs!"

Just as I was preparing to answer this disheartening comment, along came the best possible reply in a letter from one of the leading growers in the East, E. Stuart Hubbard of Poughkeepsie, N. Y.:

Service in the Orchard "TO LINGER in an apple orchard in full bloom is an experience that deeply affects many people. Our own awareness of the workings of nature through sunshine; associated varieties offering their pollen to bees in warmer air and to bumblebees when the chill breezes blow; the escape from frost in the fresh clearing, all awaken joys, expectation of fruit in Fall, faith in the hope of nature's co-operation with our efforts. The experiences of many who have never before seen and smelled such loveliness almost overcome their power of expression—so full of wonder and musings are their awakened senses.

"To share our apple bloom with the young people in our Sunday school when our own were growing to love the spiritual and the beautiful, we arranged to have the lesson and service under the apple blossoms at the crest of the hill—the clear-cut Fishkill Mountains to the south, the long ridge of the Shawangunks beyond the Hudson to the west, the faint blue of the lofty Catskills to the north. A portable melodeon blended its tones with the young voices in 'Fairest Lord Jesus' and other appropriate hymns. Picnic sandwiches and toasted sausages added to the feeling of youthful joy and companionship.

"Later on, for several years on Rogation Sunday, an invitation was given to the congregation to meet on this hill under the apple blossoms at eventide for the old English custom of blessing the crops. The Episcopal priest, preceded by the crucifer and the choir leader, all garbed in white vestments, came through the orchard to the circle of standing people who joined in the service and the singing.

"Such experiences seem to lift people for a time out of the routine rut of prosaic, burdensome things. The sharing of our natural beauties with our neighbors brings its rewards of appreciation and friendship."

Mr. Hubbard's testimony is certainly fresh confirmation that there are hidden values in our orchards for Church, School, and Home. Maybe as we venture into these fields, we shall find that even the "snobs" prove human like the rest of us. Those of you who have also discovered "windfalls" such as these are urged to write and tell us about them.

TV or Not TV IF THIS is to be a true forum, the chairman must no longer do all the talking. You people out there will naturally be taking over. And here is your opportunity. Edna Turner of Quincy, Mass., desperately plumps this question at us:

"I'd like to know what other fruit growing families think about T-V programs and what we can do about them. They have brought prize fighting right into our home, along with burlesque shows and the cheapest sort of melodrama. Their commercials constantly step over the bounds of good taste. I don't believe the flicker is good for our eyes, nor most of the subject-matter for our minds. But when I put my foot down and try to limit our family's use of television, the children find excuses and slip away to the neighbors where they can watch the screen without check. How can we maintain any decent Christian standards when this stuff pollutes the air?"

Constructive suggestions are in order as to what Mrs. Turner and other perplexed parents can do. How have you met the question in your own home? Perhaps also T-V enthusiasts will want to debate the basic attitude and argue that this new medium will improve, rather than impoverish, the good life. Please let us hear from you. Address us in care of AMERICAN FRUIT GROWER, Willoughby, Ohio. THE END

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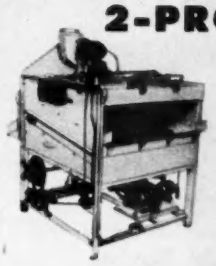

fmc **STA-FRESH PEACH WAX APPLICATOR**

The STA-FRESH Peach Waxing Process is an exclusive FMC "patent applied for" contribution to the peach growing industry. Applied with a STA-FRESH applicator STA-FRESH wax forms a thin invisible film that reduces shrinkage, retains that fresh-picked look and most important, *preserves practically all of the original flavor and weight.* The STA-FRESH process used in conjunction with an FMC Stericooler enables growers to pick their crop at its full ripeness, ship much farther with confidence that they will get top prices – that's real profit insurance.

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STERICOOLER is the registered name of FMC's specially designed and factory manufactured pre-cooling and hydro-cooling equipment. The FMC STERICOOLER is a completely self-contained unit available as a portable or stationary installation. Field heat is quickly reduced to 40 degrees in minutes by an ice water bath as the open top baskets of peaches pass through the FMC STERICOOLER. A sterilizing agent arrests decay-causing fungus and micro-organisms during the cooling process. When an FMC STERICOOLER is used fruit may be left on the trees up to 5 days longer resulting in extra tonnage, extra flavor, extra size which invariably brings extra bonus prices. You can't beat the dual-protection of FMC's processes to insure profits!

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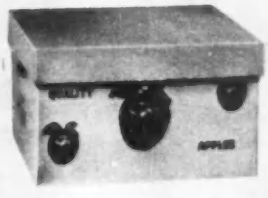
½ Bu. Boxket

These sturdy extra heavy corrugated Boxkets pack like a basket, use present owned equipment, and produce an undisturbed bulge face pack. They eliminate cushions, caps, labels and also rim cut and stave cut of fruit. When you tear off the perforated liner top you have a perfect bulge face pack. The Boxkets, in bushel and ½ bushel cost less, save storage space and stack and truck well. They are available in color and can be special printed for you.



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Many large operators also like these jumble pack boxes that come in bushel and ½ bushel sizes. They are sturdy, attractive and easy to handle.

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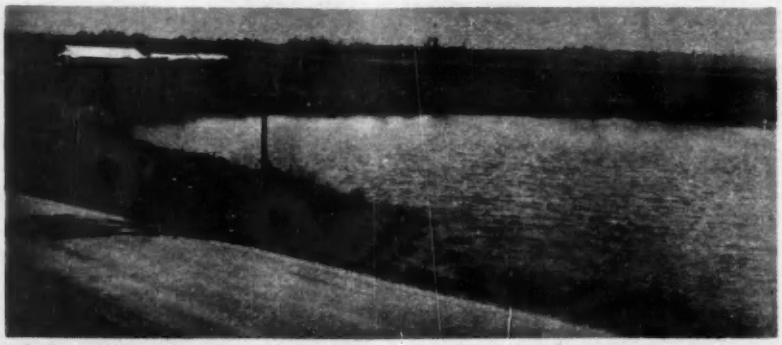


Irvin Grove, Clarksville, Ark., has been irrigating for three successive years from this reservoir on his fruit farm. The peach orchard is in the background and the packing sheds are in back of the orchard.

IRRIGATION WATER SUPPLIES

Arkansas growers plan expanded reservoir construction program in order to avert future drought disasters

By EARL J. ALLEN
University of Arkansas

THE last two years of drought in Arkansas has intensified the efforts of fruit growers in this state to provide supplemental irrigation for fruit crops. While supplemental irrigation is not a new development in Arkansas, interest has been rather sporadic until the last two years. Now, however, interest is at a high stage and development of additional irrigation plans is limited primarily by the availability of water.

Perhaps the greatest inducement for irrigation came last year when continued dry weather during the last part of May and June and through early July delayed the maturity of early peaches. A good rain fell during the first part of July and not only brought on the maturity of early peaches, but hastened the maturity of the late crop so that growers were compelled to harvest and market their entire production over a period of about three weeks when, normally, the maturity of our various major varieties would extend over a six-weeks period.

While Arkansas can be considered as well supplied with water resources, most of this is not available to the fruit grower, who is generally located on rolling uplands or in hill sections.

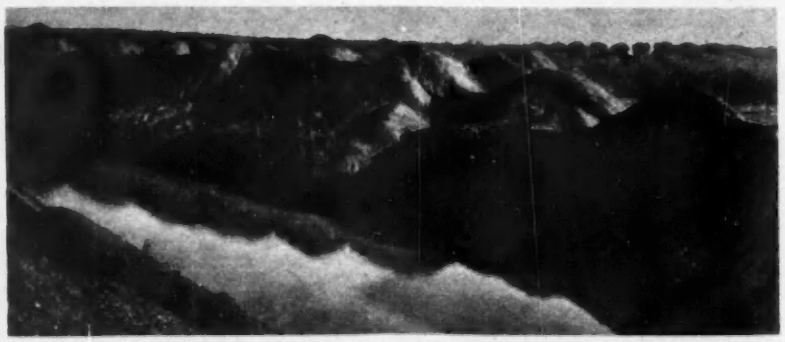
A small number of fruit growers are located in the Arkansas and Mississippi river bottoms or delta lands. In these areas obtaining water is generally a very simple matter of sinking sandpoints to a depth of 20 to 25 feet to obtain as much water as is necessary. Occasionally, a well must be bored to a depth of 75 or 100 feet to obtain water.

In the upland sections wells must be drilled to depths of 500 to 1,000 feet before reaching water in sufficient supply for irrigation. The cost of such deep wells is prohibitive at this time.

In the Clarksville area a few growers have utilized old abandoned coal mining strip pits as a source of water supply. Unfortunately, while there are many of these strip pits, very few of them are near orchards.

The most feasible source of water for most of the fruit growers in this state will be constructed reservoirs. A number of these is being utilized at present and a much larger number is being constructed. With annual rainfall varying from 40 to 50 inches in the state, well located and properly constructed reservoirs will store water from our generally heavy winter and spring rains for use during the later growing season.

THE END



One of two coal strip pits used by Taylor Landthrip, Clarksville, as a source of water for his peaches.

The Summer the Rio Grande Went Dry

It was as though the citrus trees realized the growers' desperation, for they survived in spite of substandard water applications

WATER is a factor of prime importance in crop production, especially in a semiarid area. When drought strikes and regular sources of irrigation water dry up, growers of most crops are in real trouble.

That is the situation which confronted many farmers in the Lower Rio Grande Valley last summer when prolonged drought caused extensive losses to ranchers, row-crop farmers, and orchardists; and finally dried up the lower reaches of the Rio Grande.

Crop losses due to the shortage of water ran into the millions of dollars, and large sums of money were expended in developing new (emergency) sources of water.

Thousands of Wells Drilled

Well drilling became the business of the times, and thousands of wells were sunk into the water-bearing sands and gravel beds of the Rio Grande of yesteryear. Farmers and townfolk alike soon became conscious that there is such a thing as quality in water. Wells and pumping units ranging in cost from a few hundred dollars (for home use) to units costing as much as $15,000 were installed.

The salt content of water from these wells varied from less than a ton per acre foot (almost like river water) to more than six tons. The boron content of the well water varied from less than one-quarter part per million to more than six p.p.m.

In desperation, many orchardists and nurserymen used substandard (class 3) waters on their trees. Remarkably few trees were lost as a result of the water shortage, and there is little evidence of salt and boron injury. Some orchardists realized excellent profits in spite of the drought, and the set of fruit is exceptionally heavy this spring.

The rains finally came in late August, and more than a million acre feet of good water was stored behind Falcon (International) Dam. More water could have been stored from the August flood on the Rio Grande had the Falcon project been completed at the time. The control gates have now been installed, and a reservoir capable of holding more than four million acre feet of water is now ready.—*W. H. Friend, Assoc. Co. Agt., Citriculture*

Control weeds in leafy crops with CHLORO-IPC

This photograph shows a bountiful, profitable harvest . . . all spinach, no weeds. Chloro-IPC was responsible for the excellent weed control in the above crop, and growers are finding Chloro-IPC effective on other leafy crops.

The benefits of Chloro-IPC extend beyond maximum crop yield. Tremendous savings in the cost of hand-weeding are realized as well as relief from labor shortages.

Your trial use of Chloro-IPC is suggested for the following leafy plantings:

Spinach	Upland Cress	Leaf Lettuce	Romaine
Kale	Cauliflower	Celery	Parsley
Collards	Broccoli	Chicory	Dandelion
Hanover Salad Greens	Head Lettuce	Escarole	Cabbage

Chloro-IPC dosages range from 1 quart per acre in winter on sandy soils of the east coast to 8 quarts per acre on inland mucks in summer.

Both soil type and temperature influence dosage. Lower temperatures and lighter soils need only small dosage while higher temperature and heavy or organic soils need higher dosage. Moderate rainfall is beneficial in improving and prolonging the herbicidal effectiveness.

Apply Chloro-IPC at the time of planting or transplanting, but in any case to bare soil before weed seeds germinate.

For further information on Chloro-IPC, contact your pesticide dealer.

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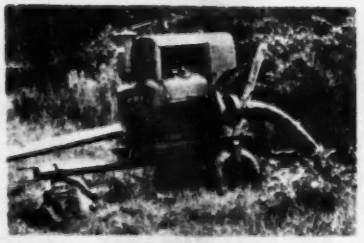

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Irrigate to

PREVENT FROST DAMAGE

Michigan berry growers turned to irrigation after all other methods failed

By JERRY H. MANDIGO

OUR very good and unusual luck of not having a serious spring frost for the last three years has proven a handicap for writing an article on Frost Prevention. This leaves us with only one choice and that is to review our experiences during earlier seasons when we had frequent killing frost and to add the research findings of Professor E. A. Kidder of the department of agricultural engineering, Michigan State College.

Over the years the small fruit growers of southwestern Michigan had tried all the frost prevention theories from smudge pots to helicopters. The results of all of these trials were painfully similar in one respect. They were all failures.

The period 1948 through 1950 established some sort of record for numerous and damaging frosts during the strawberry blooming period. The bright side of this otherwise gloomy picture was the fact that our southwestern Michigan growers gained valuable experience in frost prevention.

The author, JERRY H. MANDIGO, is district horticultural agent at Paw Paw, Mich.

Sprinklers Used

In 1948 after deciding the infra-red frost prevention machine was too expensive, several local growers decided to try water again as a means of preventing frost. Earlier attempts to use water included use of high pressure spray machines, wetting of soil just before a frosty period, and the use of sprinkler irrigation for short periods during frosty nights.

During 1948 Don Piper of Bangor observed that even the fringe area continually covered by the rotating sprinklers did not freeze but that nearly all blossoms were frozen only two or three feet beyond the irrigated area. This prompted Don and others to use small capacity sprinklers (5.8 gal. per minute at 35 pounds pressure) in 1949.

Four severe frosts occurred in the spring of 1949, thus giving us an excellent opportunity to test the effectiveness of irrigation as a means of preventing frost damage to strawberries. Each of these ffosts increased in severity until the final night when the temperature dropped to 23° in most patches. Ice up to one-half inch in thickness formed on blossoms and leaves, but no damage was done to the bloom where continual irrigation was used throughout the cold periods.

The information obtained in 1948 and during the first three frosts of 1949 was passed on to growers by means of radio. Thus, by the time of the final and most severe frost in 1949, nearly every strawberry irrigation system in southwestern Michigan was in operation.

Observe These Suggestions

By the end of this frosty period 1948–50 the growers had pooled their experiences and arrived at the following suggestions:

1) Use small-capacity sprinklers but cover all areas of the field.

2) Start irrigating when the temperature gets down to 34°.

3) Continue to apply water until the temperature has risen above 32°.

(Many growers feel they should apply water until the ice coating has all melted.)

4) Use water from the well or lake

Marden duplex

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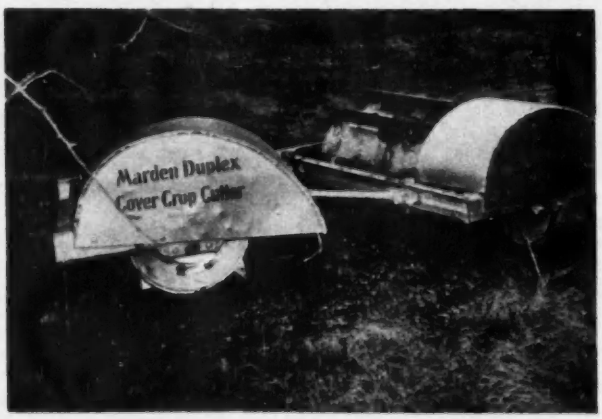
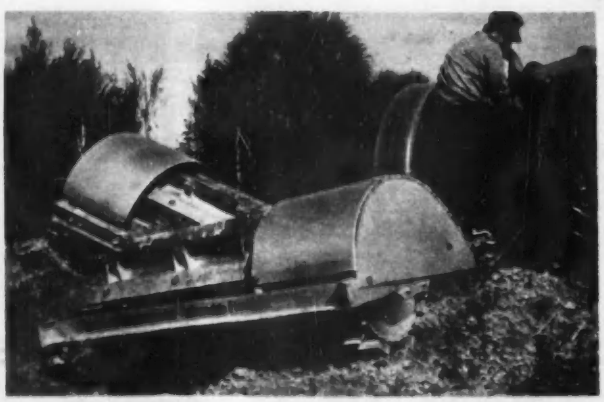


Set in tandem, with angle for 5 foot wide maximum cultivating effect.



The Marden Duplex works even in rough ground. Here it is set for a 10 foot single cut. May be set with or without angle.

This one tool replaces mowers, harrows and chippers. It's a fact. No damage to roots, fruit or limbs. It mows—for sure. Set at an angle, it also cultivates without destroying the cover crop. AND it replaces chippers because it cuts up and mulches pruning brush—any left does not interfere with its mowing and cultivating action. One prominent user with four tractors and four mowing machines, once he saw what the Marden Duplex would do, sent the mowing machines and three tractors back to the barn! Write us about your problem, giving make and model of tractor.

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as water temperature has little or no effect on frost prevention.

5) Use an air thermostat wired to an alarm to awaken the grower when the outside temperature reaches the danger point.

6) Predetermine temperature differences between your yard and the lowest point in your strawberry bed.

7) Set up and test run your irrigation system before danger of frost damage. Making corrections during a frosty night are most unpleasant.

Experiments Continue

As indicated earlier, our lack of frost during the strawberry blooming period in the last three years has prevented further grower experience. During that time, however, Professor Kidder has continued to experiment with irrigation as a means of preventing frost damage. The absence of spring frost made it necessary for Professor Kidder to use tender peppers, tomatoes, squash, and sweet corn during the heavy frost of mid-October.

Based on this experimental work Kidder recommends that sprinklers be designed to make one complete circle at least every 20 seconds. He feels it is best to continue to apply water until all ice is melted. His experience also showed that as little as .15 inch of water per hour was enough to prevent frost damage. THE END

FROST-RESISTANT STRAWBERRIES

VIRUS-FREE Premier strawberry plants grown by Robert Buskirk, Paw Paw, Mich., have shown a remarkable resistance to freezing temperatures.

The period May 4 through May 12, 1934, produced the longest series of freezing temperatures during May ever recorded by official weather stations in southwestern Michigan. Average loss in unprotected fields probably exceeded 50 per cent of the blossoms in this area which produces about 10,000 acres of strawberries. However, the cold resistance of the virus-free strain of Premier was almost unbelievable.

Bob planted the virus-free plants on some low river bottom land near the Paw Paw River which had never before grown strawberries and thus did not contain contaminating diseases and insects.

He dug all his strawberry plants this spring, with the exception of two rows of everbearing and two rows of the virus-free Premier, left for yield trials.

Official temperature the morning of May 10 at Paw Paw was 29° F. That the temperature dropped much lower where the virus-free plants are growing was indicated by the soil in an adjoining field which was frozen one-half inch deep.

Blossoms and buds in the everbearing rows apparently were 100 per cent killed. A careful check of buds in the virus-free Premier rows showed about five per cent of the flowers and buds frozen; the remainder appeared to be in excellent condition.

If this resistance to frost damage continues, it should greatly enhance the already desirable characteristics of this virus-free strain of Premier strawberries.—*Jerry H. Mandigo, District Hort. Agent, Paw Paw, Mich.*

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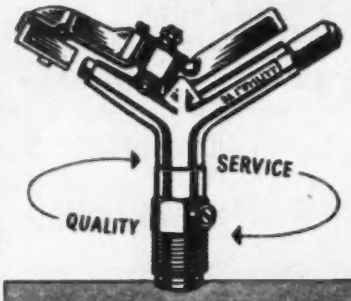

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SUMMER SOIL MOISTURE

Where does it come from?

By W. W. MAGILL

University of Kentucky

SOME 15 years ago the horticulture department of the Land-Grant Colleges of Ohio, Indiana, Illinois, and Michigan held a two-day summer general clinic in Michigan, with one day being spent at the Graham substation at Grand Rapids, Mich. (I had invited myself to join the clinic.) At that time, one of the experiments under observation at the substation was a soil moisture test in a young cherry orchard to show that clean cultivation was the proper orchard management to hold soil moisture as compared to a low growing green cover crop.

The man in charge of the experiment reported that they could not account for the results they were getting, for in all the replications the plots in the low-growing green cover crop showed more moisture, by analysis, than the dust mulch plots were showing. As I recall, no one from the four states could give a satisfactory explanation—they even doubted the ability of the soil technicians in running the moisture per cents.

As early as the dry year of 1930, I had a demonstration in an Elberta peach orchard near Paducah, Ky., where we were comparing a dust mulch with a cover crop of common lespedeza (a low growing legume). We had no rain from late May until after peach harvest. At three-week intervals I took soil moisture samples at nine-, 18-, and 27-inch depths. The ground was so dry at even the 27-inch depth that the soil would not cling to a soil auger. The peaches sized to two and one-quarter inches and up where we had the green cover crop, and were under two inches on the dust mulch plots.

It's Called Condensation

About 1942, while attending a winter meeting of the Indiana Horticultural Society, I heard the head of the agronomy department of Purdue University give a simple but scientific answer to the summer moisture question—*condensation*. He claimed no part in finding the answer, saying that it was found out in the Odessa wheat area of Russia, two years after World War I, but that the Russian report was not translated in our language until about 20 years later.

The speaker turned to a glass pitcher of water on the desk and ran his finger through the drops of water on the pitcher. He called our attention to the galvanized pipe in a deep well on a hot

Five-year-old peach tree which has been grown under Ladino clover cover crop for five years.

August day when the pump was operating—how drops of water would be showing on the outside of the water pipe. Also, how as country barefoot boys, if we walked down the dusty country road at 9:00 PM, we would burn our feet in the hot road dust; but we had enough country boy sense to walk on the cool dew on the grass.

During the dry season of 1953 in Kentucky, on plots covered with Ladino clover which was mowed in May and July and left on the soil as a mulch and with the green crop growing up through the mulch, Elberta peaches sized to two and one-quarter to two and one-half inches. No rain fell from late May through August. This field was sufficiently fertile to produce 2,000 pounds of Burley tobacco per acre, 80 bushels of corn, or, in terms of cotton language, 1½ bales per acre.

Better Try This

Before you definitely draw a conclusion that my moisture ideas are all crazy, may I offer a suggestion that you personally conduct a simple demonstration test on your orchard. If your land is too poor to grow a green cover crop in dry weather, try to help out your own local cause by applying 1,000 pounds per acre of a complete fertilizer—such as a 12-12-12 analysis. You may need a ton per acre.

Sure, this fertilizer will cost you some money, but it is not nearly as expensive as a crop of peaches under two inches at harvest. Many peach and apple feed roots will be found growing in the top few inches of soil under a mulch or low growing green cover crop where roots are not destroyed by cultivation.

To my way of thinking, *condensation* of moisture from the air (or dew) may account for two or three inches of moisture per month during June, July, and August, and that the tiny peach and apple rootlets "drink up" this moisture each evening and night to the extent that our peaches take on a two and one-quarter to two and three-quarter inch size at harvest. THE END

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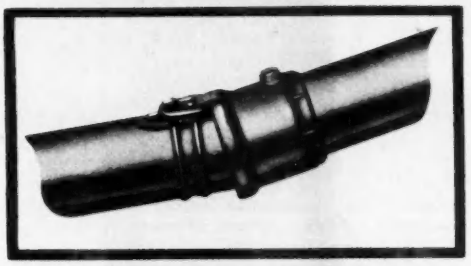

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TWO-YEAR DROUGHT DAMAGE

States hit hardest by drought report the extent of damage

LOWERED ground water supplies, loss of vigor, and in some cases death of trees resulted from the two-year drought of 1952 and 1953. Reports from many states show that fruit trees, the last to be affected by drought because of their extensive and deep root systems, were hard hit in some areas.

C. W. Ellenwood, secretary, Ohio State Horticultural Society, reports that the drought of 1953 reduced the vigor of peach and apple trees in Ohio. Buds are generally weaker than normal, but the concentration of higher amounts of nitrates in the soil may help to offset the apparent low vigor of the trees. Ohio fruit growers are becoming vitally interested in irrigation and where water is available there will be an increase in irrigated fruit acreage. Otherwise, farm ponds and mulching the trees are both much in order, Ellenwood said.

Illinois Turns to Irrigation

Harold J. Hartley, secretary, Illinois Fruit Council, reports a very considerable effect by the drought on orchard and small-fruit plantings in Illinois. However, he states, it seems that most fruit trees came through without any severe effects and indications were for a fairly full bloom this season. He reports that southern Illinois growers are becoming greatly interested in irrigation and a large number of systems have been installed. The greatest problem is that most of the small ponds and lakes are at a very low level, and if there is no rainfall it is quite probable that there will not be enough water to do any appreciable irrigating.

Kentucky Water Supplies Nil

In Kentucky, W. W. Magill, secretary-treasurer, Kentucky State Horticultural Society, reports that the soils throughout the state are relatively dry below the 10-inch depth. During the last six months of 1953 in Kentucky there was a shortage of nine inches of rain. Up until April 10, 1954, there was another shortage of over four inches. Many wells and springs throughout the state that have been a regular supply of family and livestock water are now dry.

As a result of the drought, many low dead branches are becoming apparent that in 1953 produced a good crop of either apples or peaches. Where possible, Kentucky growers are applying a mulch and will also mow cover crops and leave them on top of the land for a mulch. Several growers will irrigate their strawberry fields, after having found last year that a one and one-half-inch application of water during the harvest doubled berry yields.

Tennessee to Study Water Resources

A. N. Pratt, Tennessee state horticulturist and secretary of the state horticultural society, reports that in interpreting results of the 1953 drought it should be remembered that the summer of 1952 was also very dry and that trees in Tennessee had already been damaged by severe cold in the fall of 1950 and the spring of 1951.

On the whole, mortality of most fruit trees has not been excessively heavy but in a number of orchards this spring growers have found that many of the shaded and less favored lower scaffold limbs are dead or practically lifeless. One result of the 1953 drought on peach trees was observed in mid-March this year when frost took most of the buds of early blooming varieties. The upper half of 12- to 16-inch shoots, usually ample length for a well-spread bloom, were bare of bloom buds and many leaf buds were either dead or retarded.

It is hard to tell just where drought damage stops in Tennessee. Orchard soils, for instance, may show drought effects for several years; drought, plus high temperatures, burned out sod covers and probably much of the humus in the topsoil. The Tennessee State Horticultural Society has requested the governor to appoint a commission to study the distribution of water resources with a view to legislation which would reserve an equitable share for agricultural use.

W. R. Martin, Jr., secretary, Missouri State Horticultural Society, reports that tree loss due to the drought has not been great, although one orchard reported 15 to 40 per cent loss of trees in 1953. Loss of fruit size was heavy and trees are weak. Missouri will need above-average rainfall this spring and summer for an average fruit crop. Most of the state has had less than two inches of rain from last August up until April of this year, and many areas since last May.

In Iowa, Glenn Raines, secretary, Iowa Fruit Growers Association, reports the subsoil over most of the state is very dry. If the subsoil remains dry, it is feared that the bloom and the set may be light.

Kansas Digging Wells

In Kansas, where water supply permits, growers are digging wells, installing pumps, and preparing for sprinkler irrigation. Locations in the Kaw, Mis-

souri, and Arkansas river valley areas allow greater use of sprinklers. Kansas State Horticultural Society Secretary William G. Amstein reports that losses in strawberry plantings have been greater proportionally than in tree fruit plantings. However, he said, some individual orchards have suffered large losses. Whether this is due to site and soil differences or management is not always clear. Low winter temperatures in previous years show up a greater injury in drought years.

Arkansas Berries Suffer

In Arkansas, Earl J. Allen, extension horticulturist and secretary of the state horticultural society, reports the acreage of st awberries to be harvested in 1954 will be about 6,000 acres compared to 8,500 in 1953 and approximately 16,000 in 1952. The decrease is practically all from drought effects of the last two years. In addition, a production of 50 or 60 per cent of normal is expected from this year's acreage. Beds are very thin, with many skips.

Two successive years of drought have left commercial peach trees in Arkansas in a weakened condition. Growers estimate losses of trees varying from five to 10 per cent with state average probably about six per cent directly due to drought effect.

Louisiana Installing Irrigation

In Louisiana, Julian C. Miller, head of horticultural research at Louisiana State University, reports that as a result of the drought more than half of Louisiana's peach growers are now installing some type of irrigation. In addition, many strawberry growers are getting their irrigation systems in shape so that they can obtain maximum yields.

In Oklahoma, Frank Cross, head of the department of horticulture Oklahoma A & M College, reports that emergency watering has in most cases prevented the loss of trees in the western part of the state where the drought has been most severe.

Texas to Plant in Wetter Areas

Professor F. R. Brison of the department of horticulture at Texas A and M College, reports that peach and pecan trees in Texas have been most directly affected by the drought. Current crops have been reduced and the vitality of trees impaired. In extreme cases the trees have died. Even in east Texas where rainfall is higher and normally sufficient, trees have suffered.

Texas growers are thinking more and more about locating orchards only on soils that have good moisture-holding capacity or on sites that have some degree of natural sub-irrigation. Wider spacing of trees and the use of soil improving crops to increase the fertility and the moisture-holding capacity of the soil are receiving more and more attention. THE END

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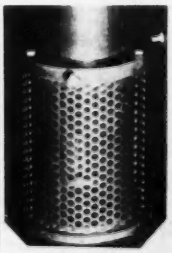

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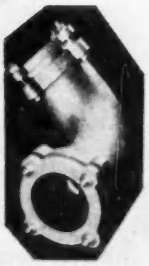

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SAVED BY A WELL

(*Continued from page 11*)

intuition. "Finish up the drilling," she said.

So down they went, and at 1,407 feet their eight-inch well came in strong. On September 1 a Fairbanks Morse deep well turbine pump driven by a 60 h.p. electric motor began to pour forth water into Atlas quick-coupling portable aluminum pipe. The No. 40 low angle Rainbird sprinklers began to quench the thirst of the soil. The only fruit left to irrigate were the winter varieties of apples.

Salvaged Crop

"Mind you, we had already lost 20 acres of strawberries, 10 acres of peaches, and all my fall varieties of apples such as Jonathans, Red Delicious, and Grimes," said Fred. "We applied 18 inches of water per acre to the winter apples from September 1 to October 10. They responded and grew remarkably well and we were able to salvage $25,000 worth of apples which would have been lost without the well."

With the success of well number one in Barry County it wasn't long before wells two and three were started and finished at Vollenweider Orchards at Seymour, Mo. The second well came in at 1,225 feet and the third at 1,450 feet.

Each well cost in the neighborhood of $15,000 with an extra $5,000 for pipe and sprinklers. Total investment in irrigation for 120 acres at Exeter and 300 acres at Seymour runs close to $60,000. "The drought of 1952 hurt us badly," says Fred. "If we had not put the wells in we would have been out of business."

Selection of the spot where the wells were drilled was made for convenience in irrigating the orchards. In Seymour one well irrigates two orchards more than one-half mile apart. One of these orchards consists of 100 acres and it is pruned, sprayed, and irrigated by a team of four men. Irrigation is started when the soil moisture gets down to 50 per cent saturation.

"We never want to get behind," he said, "since we found that under high temperatures and low humidity a tree will use one inch of water in four days."

Constant Check Required

To help maintain a constant check on soil moisture, Dr. Hibbard installed at several check stations consisting of four-foot holes, plaster of paris blocks at one-, two-, three-, and four-foot levels. Imbedded in each block are wires which when attached to an electrical meter give a moisture reading.

The 100 acres are irrigated in about three weeks requiring four settings each 24 hours. Each setting applies about six inches of water per acre. The orchard is kept in sod and it will accept this quantity of water with no runoff. A main line runs down one side of the orchard with valves for hooking on lateral lines.

Three laterals extending about one-fourth mile are set up down the tree middles. While one lateral is sprinkling the next two are in readiness. At midnight the second lateral is turned on and at 6 a.m. the third. While the third line is sprinkling the first two are moved. Through this use of extra pipe no night help is needed, labor requirements are kept to a minimum and the pump is kept in continuous operation. The extra lateral in this case costs about $1,450.

Advantages

"Sprinkler irrigation gives extra fruit size," says Vollenweider. "By increasing size from two and three-fourths inches to three inches we gain 30 per cent in volume."

Better color is another advantage. The finish may be good on non-irrigated apples but irrigated apples will develop a brighter color with more life so "they kinda look up at you," as Vollenweider explained.

In an area which once was the center of the fruit industry in the United States, the Vollenweiders are one of the few remaining orchard families. Good management, a high quality pack, and willingness to try new things has kept them in business. Fred Vollenweider's irrigation experience is a good example. THE END

DO NOT TOUCH POWER LINES WITH PIPE

THE following clipping from the *Wenatchee Daily World*, April 9, 1954, deserves posting at every grower's pump house:

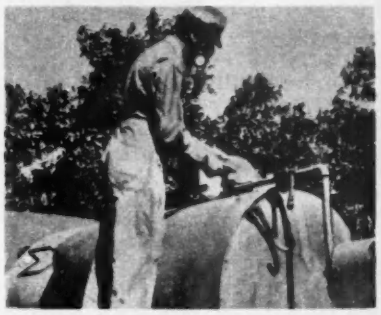
"Stanley S. Griffin and John E. Griffin were electrocuted at their farm near O'Sullivan Dam late Tuesday afternoon when a section of aluminum irrigation pipe contacted a power line. It is believed the two had stood a section of pipe on end to try to dislodge some dirt when it touched the power line."

There were at least two deaths from the same cause during 1953 reported to AMERICAN FRUIT GROWER.

Read the advertisements and remember advertisers will be glad to send you catalogs, specifications, and prices. Be sure to say you saw it in AMERICAN FRUIT GROWER.

Handle Parathion with Safety

TWO new devices for protecting grove workers handling parathion have been developed at the Citrus Experiment Station, Lake Alfred, Fla., by D. S. Prosser, Jr., assistant horticulturist. Both devices, shown below, are for emptying parathion into nurse tanks for grove sprayers or directly into the sprayer tank.—*Clyde Beale.*



The device for emptying five-pound bags, shown above, is a built-in hopper in the nurse tank with vertical hollow flutes projecting upward from a mesh bottom. Operator places bag in hopper, a lid pushes bag over flutes, and water from tank pump sprays from flutes and washes parathion out of bag through mesh bottom into tank.

The device for emptying 50-pound drums, shown above and below, replaces lid on fiberboard container. Container with device attached is placed over manhole of tank, where a flange seals it tightly. Gate in bottom of unit is released allowing parathion to drop from drum into tank below.

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From where I sit ... *by* Joe Marsh

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"You poke around all you like. Then when you've found the book you want, simply take off the button, and someone's right there to take care of you."

From where I sit, everybody likes to make his own choice. It doesn't matter whether it's books, or preferences in clothing or makes of cars. And it's no surprise that folks have personal preferences in beverages, too. So if your neighbor orders a refreshing glass of beer while you're having coffee, remember he's entitled to his choice, too.

Joe Marsh

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NEW FOR YOU

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It is important to have your irrigation pump equipped with the correct motor. General Electric can help you with this problem with their new booklet entitled, *How to Select and Apply Electrical Equipment for Irrigation Pumping* (GEA-5917B). It contains information on the selection and application of electrical equipment for irrigation pumping, with photographs, drawings, and tables outlining the steps. Sections on maintenance, wiring, and operating details are included. Merely write Art Hemker, General Electric Company, 1 River Rd., Schenectady 5, N. Y., for your copy.

Two in One

The new "Minijet" is a pump many growers have been looking for. This unusual pump can be used for shallow well service, and by merely disconnecting the jet and installing it in the well, the "Minijet" becomes an efficient deep well pump. It is self-priming and is powered by a one-third h.p. electric motor. Why not write L. H. Taylor, The Deming Company, Salem, Ohio, for the facts?

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A few months ago we inaccurately referred to a hand pruner as a "Snap-Cut" pruner. The Seymour Smith "Snap-Cut"

- **"MINIJET"**
- **LOW ANGLE SPRINKLER**

pruner, shown here, has a sharp double ground cutlery steel blade which acts on a non-dulling soft metal anvil. The handles are shaped to a comfortable grip with an automatic snap catch and finger guard. The pruner is worth your attention, and we suggest you write Justin Smith, Seymour Smith & Son, Inc., 41002 Main St., Oakville, Conn., for details on the "Snap-Cut" line.

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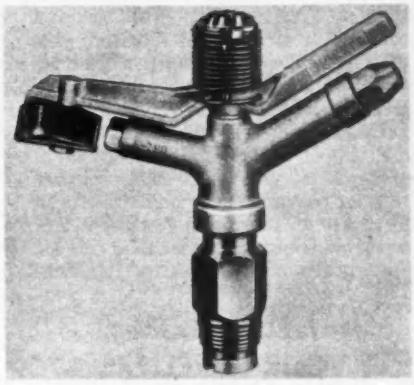

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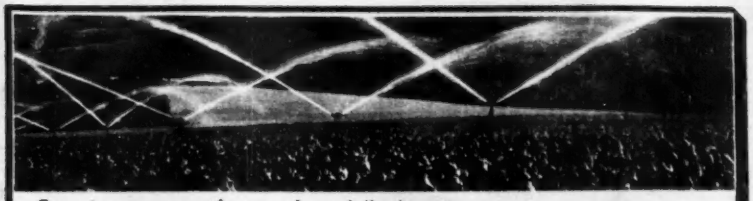
Orchard Traction

Spraying for scab during this time of year is a real problem. The orchard floor is wet and the earth is sticky from spring rains. Many growers may miss important fungicide sprays because they can't get through their orchard. The new four-colored Caterpillar booklet, *Caterpillar Orchard & Vineyard Tractors*, may be of great help to you. Write Bob Culshaw, Caterpillar Tractor Company, AFG 54, Peoria, Ill., for your free copy.



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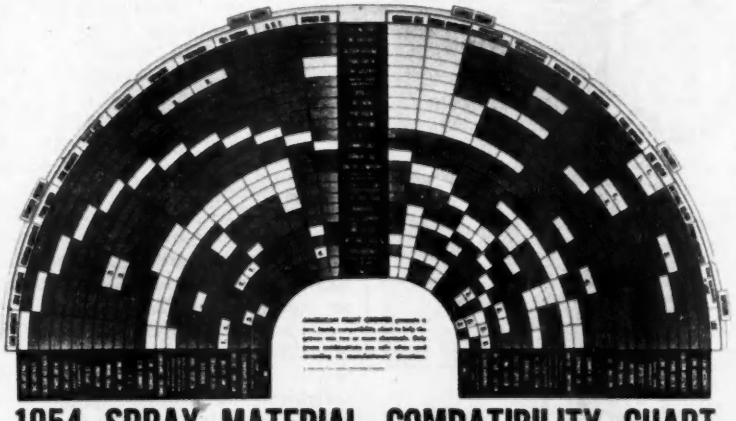

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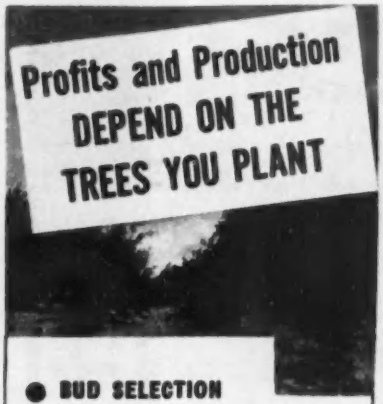

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IRRIGATION IN HUMID AREAS

(Continued from page 9)

With peaches, on the other hand, most of the growth in size is made during the period of 30 to 35 days prior to harvest maturity. Thus, acute water shortage during that period has a more drastic effect on the final size of peaches than a similar short period of water shortage would have on apples.

Many orchard sites, good from the standpoint of elevation and air drainage, unfortunately do not have the deep and retentive soil that is desirable from the moisture-holding standpoint. Orchards on deep and retentive soils have not suffered seriously for water even in relatively dry years like 1953. On the other hand, orchards on shallow soils will have the size of fruit and total yield reduced to some extent in at least half of the years in many eastern areas. Thus, the value of irrigation will be relatively greater on the shallow soils.

When is Irrigation Feasible?

Possibilities of irrigation, of course, vary with each individual orchard. First and foremost is the question of water supply; it takes a lot of water to irrigate. Fifty acres of orchard can be sprayed once with the water required to put one inch of irrigation on one acre.

Before an orchardist is justified in spending money for pumping plant and piping to distribute water over the orchard, he should be sure that he has an adequate and dependable water supply. He should have a minimum supply of about six acre-inches for apples and of four acre-inches for peaches before the cost of the distribution system would be justified. To impound six acre-inches of water for a 50-acre orchard requires a five-acre pond averaging about seven feet deep, since there is always some loss of water from seepage and evaporation.

Aside from the water sources, it will generally cost somewhat over $100 per acre for a pump, portable pipe, sprinklers, and other equipment to irrigate an orchard. This is in addition to developing the water source, whether it be a large pond or a well. Such an investment in equipment is not warranted unless the water supply is dependable and sufficient.

Value of Crop Increases

Where adequate water supplies are available, or can be developed at moderate cost, the apple or peach grower with relatively shallow soil should be able to increase his production substantially in about half the years by applying irrigation water. The value of the crop will be increased more than the tonnage since large fruit is worth much more than small fruit. The increase in fruit tonnage alone may range from 100 per cent in the most severe drought years to nothing in the years of optimum well-distributed rainfall.

The average increase in production in such orchards as a result of irrigation, however, will certainly average 20 to 25 per cent in most sections of eastern United States. The New England fruit districts appear to be less subject to severe drought conditions than do districts in the southern and western parts of the apple-growing areas of eastern United States.

The benefits that will accrue from irrigation of soils that are deep and retentive of moisture will be much less than on shallow soils. Fruit size and tonnage in orchards on retentive soils four feet or more in depth will be reduced only about one year in four as a result of water shortage, and in those years the reduction will be less than in orchards on shallow soils. Irrigation of orchards on such deep soils probably will not pay unless the orchardist is so fortunate as to have a ready and dependable source of water that can be applied at moderate cost. THE END

NEWS FROM YOUR SUPPLIERS

For a leaflet describing Malaphos insecticide, write **Eston Chemicals Division, American Potash & Chemical Corporation,** 3100 E. 26th St., Los Angeles, Calif. Malaphos is the trade name for malathion recommended for spider mites, aphids, leafhoppers, mealybugs, and soft brown scale. It is recommended for use on such crops as apples, pears, tomatoes, beans, peas, and ornamentals.

California Spray-Chemical Corporation, Richmond 4, Calif., reports that captan has been approved for use as a strawberry harvest rot control. Captan is formulated and sold under the trade name Orthocide by California Spray-Chemical. Up to 66 per cent greater yield for Orthocide-treated strawberry plots has been recorded in some sections of the country, and all testing areas have noted definite improvement in the control of Botrytis rot. Not only did the Orthocide give yield increases, but also increased the transit storage life of strawberries.

"Glyodin" has been coined as the common name for the fungicide known to fruit growers as Crag Fruit Fungicide 341. Crag Fruit Fungicide 341 has performed an outstanding job for fruit growers in the control of apple scab and cherry leaf spot. It is a product of **Carbide and Carbon Chemicals Company, Division of Union Carbide and Carbon Corporation,** 30 E. 42nd St., New York 17, N. Y.

SPRAY ECONOMIES

Extra cost of new pesticides is more than offset by greater yields, higher quality of apples

By ELDON S. BANTA

RECENTLY, at the meeting of the West Virginia Horticultural Society, Dr. Edwin Gould elaborated upon some actual and some potential economies in developing a spray program using new materials. His report covered two years of experiments at the West Virginia Experimental Farm at Kearneysville, of which he is superintendent.

Dr. Gould's experimental orchard consisted of an equal number of apple trees of each of these varieties: Delicious, Stayman, York, Rome Beauty, and Golden Delicious. The trees were 15 years old last year.

Several different spray schedules were incorporated in the test involving a number of new and old chemicals. The program using captan and lead arsenate as the basic fungicide and insecticide was especially outstanding. While this program was the most expensive from the standpoint of cost of materials, it produced the highest yields and the yield of highest quality and size of apples. The benefits from the program over and above the additional cost were responsible for making this program the most economical.

Summarizing the results for two years Dr. Gould came up with these figures of comparison:

BASIC SCHEDULE	COST PER ACRE	FRUIT BU. PER ACRE 1952	FRUIT BU. PER ACRE 1953
Captan	$100.70	556	895
Sulfur	68.60	319	612
Differences	$ 32.10	237	283

What this amounts to is that for $32.10 additional cost in materials, 237 bushels more of apples were grown per acre in 1952 and 283 more in 1953. The real economy in the schedule is quite apparent. In addition to the total yield, the production of number one and fancy apples was much greater, especially as to finish. Sulfur used almost anywhere in the program depressed yields and always russeted Golden Delicious severely.

Another observation in the spray experiments was that mercury materials used in the pre-bloom scab sprays always reduced the set of fruit. However, this reduction may be a benefit in varieties which tend to set too heavily. Further tests of these materials, as well as others, will be continued for the next few years.

The basic captan-lead arsenate spray schedule is outlined below to show how the program went together during the entire season. This is one of the programs of pest control Dr. Gould is suggesting to his growers this year. Several followed it last season and were highly pleased with the results, too. Perhaps others may want to try this schedule on at least a part of their orchards this season and next. Captan is sold under the trade name of Orthocide, manufactured by the California Spray-Chemical Corp., Richmond, Calif., and Captan 50-W, made by Stauffer Chemical Co., 380 Madison Ave., New York 17, N.Y.

THE END

SPRAY SCHEDULE FOR APPLES

APPLICATION	MATERIAL	QUANTITY USED	COST OF MATERIAL	MATERIAL COST PER 100 GAL.
Dormant	Dinitro (40%)	1 lb.	$ .56	
	Superior oil	2 gal.	1.02	
				$1.58
Pre-pink	Captan	2 lbs.	1.44	
				1.44
Pink	Captan	2 lbs.	1.44	
				1.44
Petal Fall	Captan	2 lbs.	1.44	
	Lead arsenate	3 lbs.	.87	
				2.28
First cover	Captan	2 lbs.	1.44	
	Lead arsenate	3 lbs.	.84	
	Rhothane	1½ lbs.	.60	
				2.88
Second cover	Captan	2 lbs.	1.44	
	DDT	2 lbs.	.50	
				1.94
Third cover	Same as second			1.94
Fourth cover	Same as second			1.94
Fifth cover	Captan	2 lbs.	1.44	
	Rhothane	1 qt.	.60	
				2.04
Sixth cover	Captan	2 lbs.	1.44	
	DDT	2 lbs.	.50	
	Aramite	1½ lbs.	.92	
				2.86
			TOTAL COST	$20.34

At 500 gallons per acre, cost of spray material per acre is $101.70

NEW STORAGE BULLETIN

THE latest bulletin on costs and construction of refrigerated cold storages has been published by Michigan State College. It is Special Bulletin 389, entitled *On the Farm Refrigerated Fruit Storage.*

Authors H. P. Gaston and J. H. Levin discuss advantages, first costs and annual costs, and storage location, layout, and management. They conclude that the costs of construction range from approximately $1.20 to $2.40 per crate of capacity. Total annual operating costs range from approximately 20 to 35 cents per crate.

The study revealed that on the average, seasonal advances in the price of apples and the other material advantages realized are sufficient to defray all the expense of on-the-farm storage and leave a substantial net profit on the investment. The bulletin may be obtained by writing Michigan Experiment Station, East Lansing.

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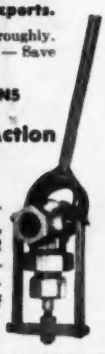
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An advertisement of B. F. Goodrich—First in Rubber

SAN JOSE SCALE

(*Continued from page 12*)

evident. Each female produces an average of 200 to 300 very small, active young, called crawlers, that move around on the plant on which they are born and are sometimes blown or carried to other plants. Crawler production is lower in the spring and higher later in the season.

Ordinarily the young settle down in a few hours on the bark or on leaves or fruit, insert their beaks, and begin to secrete a waxy material, which soon forms a circular, scalelike covering that increases in size as the insect develops. All except the males remain in one place the rest of their lives. There are one or two generations in northern fruit areas and three or four or more farther south.

Control. **Spray the trees early in the spring before the buds open with a petroleum oil emulsion. Dilute it to provide four per cent oil in a spray for use in the Pacific Northwest and three per cent in other areas. If a so-called "Superior-type" oil, such as is now widely recommended in the East, is used, a dilution that will provide two per cent oil in the spray is adequate.**

Control can also be obtained with parathion, one and one-half pounds of 15 per cent wettable powder per 100 gallons of spray in two summer applications, or one-half pound in three or more summer spray applications applied at or near the times crawlers are most active. In the Pacific Northwest a single application of parathion, one pound of 25 per cent wettable powder per 100 gallons of spray, can be used effectively during the period from the delayed dormant to the pre-pink stage of bud development.

Limited tests indicate that malathion, two pounds of a 25 per cent wettable powder per 100 gallons of spray, can be substituted for parathion with little loss in effectiveness. Malathion is a much safer material to handle than parathion.

Parathion is a dangerous poison; all safety precautions noted on the label should be observed in using it.—*Howard Baker, USDA.*

The Orchard Home

COOL, thirst quenching beverages from basic lemonade to fruit punches and easy-to-make frozen fruit deserts are featured this month. I know you will want to try them.

Here's the basic lemonade. It's easy to make and mixes smoothly with fruit juices:

Lemonade

1 cup lemon juice (6 lemons)
1 cup simple sugar syrup
3½ cups water

Add lemon juice to syrup and dilute with water, adding more syrup if a sweeter drink is desired. Pour over cracked ice in tall glasses. Lemon slices, orange slices, mint leaves, fresh berries, or pineapple sticks make attractive garnishes.

Simple Sugar Syrup

Boil equal amounts of sugar and water about 10 minutes; pour into a sterilized jar, cover, chill, and use for beverages.

A novel idea for the party-wise woman who wants to dress up her ice cubes:

CITRUS ICE CUBES

Mix equal parts of water, lemon juice, and orange juice. Freeze in refrigerator tray. When partially frozen, place a tiny wedge of unpeeled orange or lemon or a mint leaf in each cube.

Following are two fruit punches you might like to try on warm summer evenings:

HOLLYWOOD PARADE

1 pint orange juice
1 pint orange sherbet
1 pint vanilla ice cream
1 pint chilled gingerale

Beat orange juice, sherbet, and ice cream with beater until well mixed. Add gingerale. Stir and serve at once from punch bowl. Serves 10.

FRUIT MINT PUNCH

1 quart water
2 cups sugar
2 cups grape juice
1 cup strawberry or other fruit juice
Juice 4 oranges
Juice 8 lemons
12 or more sprigs mint

Boil sugar and water together 5 minutes. Separate part of mint sprigs, cover with boiling water and steep 5 minutes. Strain and add the liquor to cooled syrup. Add fruit juices. Let stand 1 hour or more. Add chipped ice and dilute as desired. Garnish with mint leaves or sliced fresh strawberries.

Ever heard of a pear soda? Well, here's the recipe, which was first introduced out West:

PEAR SODA

Take 5 canned pear halves (or, if you want a peach soda instead, use canned peaches). Add 2 tablespoons syrup from the can, 1¼ cups chilled milk, and 3 scoops vanilla ice cream. Beat until smooth and foamy. Pour into 2 tall glasses or a giant beaker; fleck with nutmeg.

Below are some frozen desserts that are simple to make and attractive to look at, and, most important of all, good to eat!

PEAR MALLOW

18 marshmallows
1 cup fresh pear pulp
4 tablespoons any fruit juice
3 teaspoons lemon juice
3 tablespoons syrup from preserved ginger
4 tablespoons sugar
½ pint whipping cream

Steam marshmallows with the 4 tablespoons of fruit juice in double boiler. Add crushed pears with which you have mixed sugar, ginger syrup, and lemon juice. Cool. When cold and slightly stiffened, combine with the whipped cream, pour into trays, and freeze.

MOUNT VERNON FREEZE

¾ cup sugar
1 cup water
½ cup milk
½ cup fresh lemon juice
2 egg whites
¼ cup sugar
2 teaspoons grated lemon peel
20–25 sweet cherries

Combine ¾ cup sugar and water. Cook 5 minutes. Cool and add milk, lemon juice, and peel. Pour into freezing tray, freeze firm. Beat egg whites, gradually adding ½ cup sugar, and beat until stiff. Take frozen mixture out of tray and beat well. Fold in egg whites. Return to tray; when almost frozen top with cherries, in two rows. Makes about 6–8 servings.

ORANGE SHERBET

1 tablespoon gelatin
2 tablespoons cold water
1½ cups sugar
1 cup water
2 egg whites
2 tablespoons sugar
2 cups orange juice
3 tablespoons lemon juice

Soften gelatin in 2 tablespoons water. Boil the 1½ cups sugar and 1 cup water 5 minutes to make syrup. Dissolve gelatin mixture in hot syrup. Beat egg whites until frothy and add the 2 tablespoons sugar. Continue beating until stiff. Beat syrup into egg whites, slowly, then mix in fruit juices. Pour into freezing tray and set cold control for fast freezing. Beat once after sherbet has frozen quite firm and return to refrigerator to finish freezing. Yields about 1 quart.

CRANBERRY SHERBET

1 one-pound can jellied cranberry sauce
2 teaspoons grated lemon rind
3 tablespoons sugar
6 tablespoons orange juice
2 stiffly-beaten egg whites or 1 cup heavy cream, whipped

Break up cranberry sauce with fork. Add lemon rind and sugar dissolved in orange juice. Freeze in refrigerator tray until partially set; fold in egg whites or cream. Freeze until firm. Serves 6. Spoon sherbert over chilled assorted fruit in sherbets and serve.

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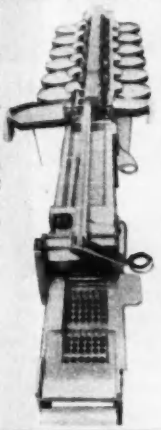

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RICHARD T. MEISTER, *Editor*
H. B. TUKEY, *Associate Editor*

What Foreign Visitors Think of Us!

NUMEROUS delegations and commissions of fruit growers have been visiting America the last few years from every corner of the world. They have been sent here by their respective governments to study the American fruit industry and to take back to their home countries some of the impressions, observations, and practices which will be helpful to them. It is most interesting to read the reports which they write and send back to us.

One of the most interesting is the following which gives 10 impressions of America:

1) The high degree of mechanization and use of machinery.

2) The vast distances involved in transporting produce to market.

3) The wonderful weather and scenery encountered.

4) The efforts put forth to co-ordinate experimental and extension work by government and state agencies.

5) The organization for inspection of fruit and improvement of pack.

6) The shortage of labor, and the high rate of pay for workers.

7) The great variety of soil and weather conditions.

8) The development of irrigation in connection with fruit production.

9) The display and sale of fruit and other perishables in terminal markets, supermarkets, and roadside stands.

10) The willingness of American fruit growers, extension and experiment station workers to share "know how."

Of the 10 items that are listed the one that perhaps should be placed first is the tenth, namely, the willingness of American fruit growers and extension and experiment station workers to share "know how."

This is really the key to America. Foreign visitors comment repeatedly that the strangest thing about America is that the window shades are always up and that one can walk down the street and look into the homes along the way. By contrast, most homes in Europe are behind stone walls or are shuttered or the blinds are drawn. One never knows what is behind the stone wall, the shutters, or the blinds.

Henry Bailey Stevens in his monthly "Windfalls" has been asking for the features of fruit growing that appeal to us. For ourselves, we would like to put down the statement that it is the clear-eyed, frank, willing unselfishness of the fruit grower, whose aim always seems to be to help the other fellow in any way that he can. Somehow he holds no secrets. He enjoys his work and he wants everyone else to know about it and to share with him. It is a wonderful industry with which to be identified.

Youth Appeal

NEW ENGLAND Flying Orchardist Mike Moriello believes the airplane is a potential farm asset, not only for any economic and mechanical usefulness it offers in spraying, but as generating a new interest among young people, says *Food Marketing*.

"The mechanizing of farming has good Youth Appeal," continues this New England publication. It "should help keep young people on the farm and widen the base of farming as an enterprise. Whenever we go to a field day or any other gathering at which farm machinery is displayed, we note the youth looking over the devices.

"Some folks are depressed by mechanization. Others see freedom in it and a shining train of other good things. If man is to make the machine his servant rather than his master, it is Youth that will do it. The farm is a likelier place on which to master the machine than the city. Exhaust fumes from gasoline motors have freer air in the country in which to dissipate."

Fruit Talk

According to **Sardar Singh** of **India, pollinating insects** become fixed to a small area of a blossoming crop. Thus, an individual bee has been found to work **exclusively upon one tree** for a considerable period and even to return to the same tree in later visits. This suggests the value of a **pollinizer grafted into every tree.**

Segueira and Steeves of **Harvard University** have found that a certain fungus which causes leaf drop in coffee produces a material which **inactivates the hormone** (indoleacetic acid) normally present in a leaf and which normally **prevents leaf drop.** Perhaps other agencies, such as **cherry yellows,** act in the same way.

Copper deficiency of **apple** and **pear trees** has been reported from England, and easily corrected by applications of **copper sulfate** as a **dormant spray,** as well as by soil applications, foliar sprays, and soil treatments.

James Crutchfield of **Pittsburgh,** the grand old man of fruit and vegetable marketing in America, maintains that the advantage in America is always with the **seller** but that the seller must be armed with **candor, commonsense,** and **fairness.**

A box of beautiful **Anjou pears** (with new plastic liner), each fruit wrapped in the famous Hartman wrap (named for **Henry Hartman of Oregon State College**), arrived with the compliments of **John M. Rogers of McCaffrey, Rogers and Brown** of Chicago. Taken promptly from the boxes and packed in a bureau drawer, they ripened to the perfection of any fancier of the pear. It is a pity that the average consumer does not know the **pear at its best.**

Goodman and Hemphill of Missouri report that the same **hormone** (indoleacetic acid) which favors tree growth and retards leaf drop and which occurs naturally in plants, also **increases the effectiveness of streptomycin and terramycin** in **fire blight control.** Here is a new angle to disease resistance that will be worth watching as research workers unfold the story.

Michigan is one of the very few states having legislation for the **cleaning** up of **neglected orchards.** Nearly a **million trees** have been removed since this program was established in 1945, and, in addition, many property owners have been induced either to spray or to remove trees themselves.

Cox Orange Pippin apples have reached a price of **43 cents a pound** on retail London markets this spring.

Molybdenum deficiency has recently been identified in **Florida citrus** by **Stewart and Leonard** as conspicuous yellow spots on the leaves, and fortunately readily corrected by **one-tenth of an ounce of sodium molybdate** per tree applied as a foliar spray.

Batjer, Rogers, and Thompson report phenomenal control of **"blossom blast"** in **pears** in Washington by sprays of **two pounds of boric acid** in 100 gallons of water applied one week before full bloom. Seventy per cent of the blossoms of **unsprayed trees** were **"blasted"** within five days.

Griggs, Vansill, and Iwakiri of **California** have shown that apple, almond, pear, plum, peach, and cherry pollen may be held in a home deep freezer for **several hundred** days and still retain fair germination **(45 to 80 per cent)**

—*H.B.T.*

Coming Next Month

- Laborsaving Devices for the Fruit Farm
- Keep Up-to-Date on New Equipment
- How Fruit Sprays Affect Eating Quality of Apples
- Buyer's Guide

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45% urea nitrogen in free-flowing shot form

Whenever your crops need supplemental nitrogen, "NuGreen" can supply it quickly, without waste, with less work. For greater yields of fruits, vegetables and certain field crops, too . . . use "NuGreen."

IN FOLIAGE SPRAYS. "NuGreen" sprays go to work immediately. The leaves absorb it quickly with no waste, no excess feeding either. Crops get the nitrogen they need even when roots are too dry, cold or wet to get nitrogen from the soil. Use it alone or in regular pest-control sprays.

IN IRRIGATION WATER. Water carries "NuGreen" to all the roots the water reaches, for prompt, even feeding. Penetrates to all the roots, isn't fixed in the first few inches of soil, yet doesn't leach out of reach. Adapted to all types of irrigation equipment.

IN SOIL APPLICATIONS. Concentrated "NuGreen" saves most of the hauling and handling in ground or air application. Ideal for quick, efficient air application that fits needs of crop when wet soil, heavy crop growth or large acreage makes other methods impractical. Won't corrode equipment, either.

NuGREEN®

is a concentrated free-flowing shot form of urea nitrogen. It dissolves readily in water, comes in 80-lb. bags, and is available from distributors in all major agricultural areas.

DUPONT
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Better Things for Better Living
. . . through Chemistry

E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Wilmington, Delaware

"NuGreen" is your best buy in supplemental nitrogen—see your nearest distributor

How much do you know about MALATHION*

(Cyanamid's new organic phosphate insecticide)

Did you know...

That malathion is one of the most widely effective of *all* insecticides?

That malathion is the *only* organic phosphate insecticide offering you a wide margin of safety in handling? (Called "one of the safest insecticides to handle" by USDA.)

That malathion is compatible with most other spray materials?

That malathion residues on crops disappear quickly? (Generally less than 1.0 part per million ten days after last application.)

That growers who have used malathion on many different fruit and vegetable crops report outstanding success with malathion against aphids, mites, leafhoppers, Mexican bean beetle and a host of other insect pests?

That malathion also kills flies, even strains which have developed resistance to other insecticides?

Want to know more?...

Write today for MALATHION GROWER'S GUIDE.

Consult your local agricultural authorities for suggestions on dosages and application procedures. Malathion insecticides are available from well-known manufacturers.

*Also known as MALATHION

Excellent control of pear insects

Oregon pear orchardists report that malathion proved highly satisfactory in controlling pear psylla, spider mites and aphids during the 1953 season.

AMERICAN Cyanamid COMPANY

Manufacturer of MALATHION Technical

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